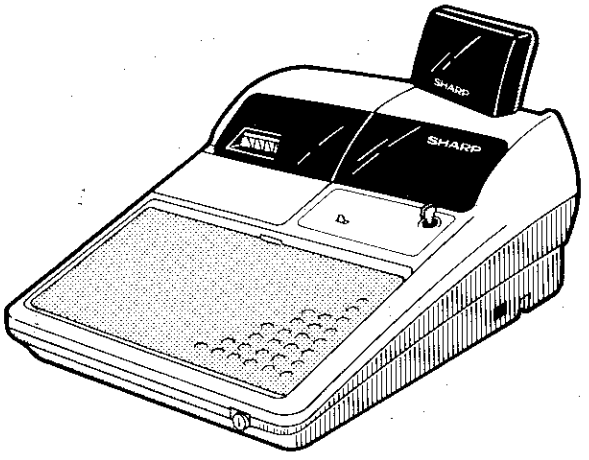
ER-A670VSM

SHARP SERVICE MANUAL

CODE: 00ZERA670VSME



ELECTRONIC CASH REGISTER

MODEL ER-A670

SRV Key : LKGIM7113RCZZ
PRINTER: M-T245
(For "V" version)

CAUTION
EXTREME CAUTION MUST BE TAKEN WHEN SERVICING THIS MACHINE. EVEN THOUGH THE MODE SWITCH IS IN THE ⏻ POSITION, VOLTAGE IS STILL SUPPLIED TO THE ENTIRE MACHINE.
WHEN WORKING ON THIS MACHINE MAKE SURE THAT THE POWER CORD IS REMOVED FROM THE WALL OUTLET.

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PARTS GUIDE

Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

CAUTION:
The socket-outlet shall be installed near the equipment and shall be easily accessible.

VORSICHT:
Die Netzsteckdose muß nahe dem Gerât angebracht und leicht zugänglich sein.

ATTENTION:
La prise de courant murale devra être installée à proximité de l'equipement et devra être facilement accessible.

AVISO:
El tomacorriente dede estar instalado cerca del equipo y debe quedar bien accesible.

VARNING:
Det matande vägguttaget skall placeras nära apparaten och vara lätt åtkomligh.

CHAPTER 1. SPECIFICATIONS

1. Appearance/Rating

1) Appearance

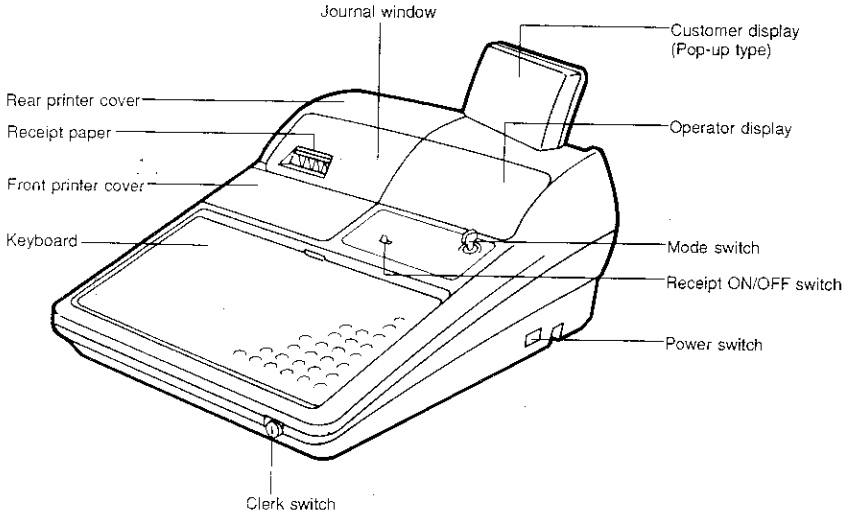


Fig. 1-1

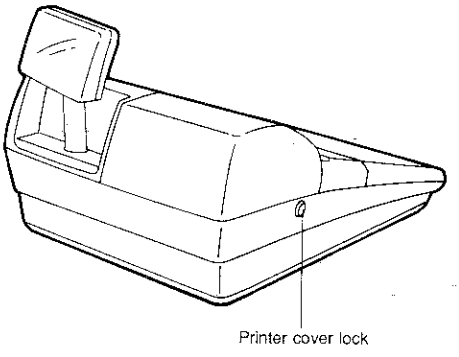


Fig. 1-2

2) Rating

Power source	AC local voltage (±10%) 50Hz
Power consumption	Standby: 20 W Maximum: 68 W(Germany), 69 W(U.K), with options installed.
Operating temperature	0°C~40°C (32°F~104°F)
Operating humidity	10%~90% (RH)
Physical dimensions, including the drawer	374(W) × 483(D) × 215(H)mm
Weight	8.5 kg

2. Keyboard

1) Standard keyboard layout

↑ RECEIPT	↑ JOURNAL	TEXT #	TEXT 1	TEXT 2	TEXT 3	TEXT 4	PRICE LEVEL 3	10	20	30	40	50	60	70	80
RCPT	GC RCPT	16	17	18	19	20	PRICE LEVEL 2	9	19	29	39	49	59	69	79
SLIP	VP	11	12	13	14	15	PRICE LEVEL 1	8	18	28	38	48	58	68	78
RCPT SHIFT	GC COPY	6	7	8	9	10	#	7	17	27	37	47	57	67	77
GUEST #	AUTO	1	2	3	4	5	WITH OUT	6	16	26	36	46	56	66	76
VAT SHIFT	VAT	⊗	•	CL	DEPO (+)	NC	WITH	5	15	25	35	45	55	65	75
%1	%2	7	8	9	DEPO (−)	GLU	CR2	4	14	24	34	44	54	64	74
⊖1	$2	4	5	6	AMT	NBAL	CR1	3	13	23	33	43	53	63	73
P0	RA	1	2	3	PLU/SUB	EX1	CH	2	12	22	32	42	52	62	72
RF	∞	0	00	000	NS	ST	TL	1	11	21	31	41	51	61	71

Fig. 2-1

2) Key top name

① Standard key top

Keytop	Description
0 to 9, 00, 000	Numeric keys
•	Decimal point key
C L	Clear key
⊗	Multiplication key
DEPT. 1~20	Department 1~20 keys
↑ RECEIPT	Receipt paper feed key
↑ JOURNAL	Journal paper feed key
RCPT	Receipt print key
VP	Validation print key
#	Non-add code entry key
AUTO	Atutomatically entry key
NS	No sale key
VAT	Value added tax key
SLIP	Slip print key
GC COPY	Guest check copy key
⊖ 1	Discount 1 key
⊖ 2	Discount 2 key
% 1	% 1 keys
% 2	% 2 keys
PO	Paid out key
RA	Received on account key
RF	Refund key
∞	Void key
AMT	Amount key
PLU/SUB	PLU/Subdept. code entry key
EX1	Currency Exchange 1 keys
PLU 1~80	Direct/Sub department 1~80 keys
NBAL	New balance key
ST	Tax included subtotal key
CR 1	Credit 1 key
CR 2	Credit 2 key
CH	Check key
TL	Total key
RCPT SHIFT	Receipt Shift key
GUEST #	Guest Number entry key
VAT SHIFT	VAT Shift key
TEXT #	Text Number Entry key
TEXT 1~4	Direct Text Entry keys
PRICE LEVEL 1~3	PLU Price Level keys
WITH OUT	With out key
WITH	With key
DEPO (+)	Deposit key
DEPO (-)	Deposit refund key
NC	New Check key
GLU	Guest Look Up key
GC RCPT	Guest check receipt issue key

② Option key top

Keytop	Description
DEPT. 21~99	Department 21~99 keys
PLU 81~158	Direct/Sab department 81~158 keys
⊖ 3, 4	Discount 3 and 4 keys
% 3, 4	%3 and 4 keys
CR3~8	Credit 3~8 keys
CA 2	Cash 2 key
EX 2~9	Currency Exchang 2~9 keys
AUTO 2 ~5	Automatically entry key 2~5
1/2	1/2 key
CLERK#	Clerk code entry key
CLERK 1~15	Clerk entry keys 1~15
TEXT 5~10	Free Text keys 5~10
FINAL	Tentative finalize key
HOTEL TRANS.	HOTEL transfer key
HALF PINT	Half pint key
VIP	VIP sale key
B. T.	Bill Totalizing key
TRANS OUT	Trans OUT key
TRANS IN	Trans IN key
C. BILL	Cumulated Bill key
CASH TIP	Cash Tip key
NON CASH TIP	Non Cash Tip key
TIP PAID	Tip Paid key

3. Mode switch

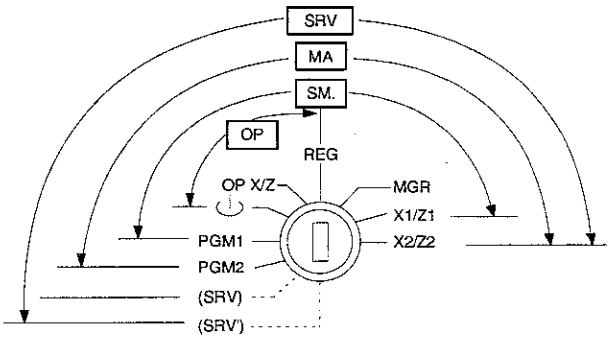


Fig. 3-1

* The key can be removed in the REG or OFF position.
* In the SRV' mode, key inputs are prohibited and no display is made.
* With the key in the off position power is still supplied to the main PWB.

[Functions]

- Function for each key position
- SRV': System reset
- SRV: Service mode (Service programming)
- PGM2: Allows programming of an item that is not changed frequently, in addition to the PGM1 mode programming.

- PGM1: Allows programming of items frequently changed (e.g. department, PLU pricing, and discount rate setting).
- OP/XZ: Allows X or Z operation by servers or cashiers.
- REG: Allows registrations.
- MGR: Allows the operations, by authorized person such as a manager (e.g. correction after transaction finished or cancellation of entry limits), which are not permitted to ordinary cashiers.
- X1/Z1: Allows reading and resetting of a day's sales total.
- X2/Z2: Allows reading or resetting sales totals in a specified period.
- ⏻: Switching off the display to prevent key board entries.
  (The setting does not turn off the AC power.)

4. Display

1) Layout

① Operator display

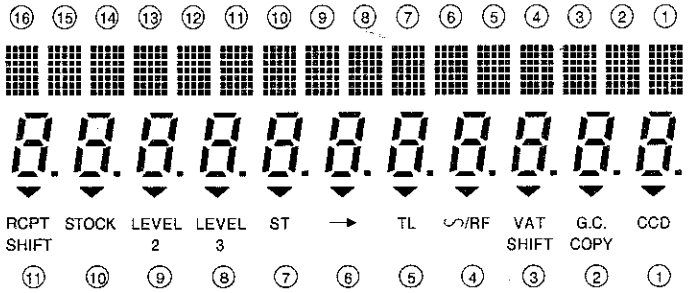


Fig. 4-1

	Dot display	7 seg display
No. of positions	16	11
Color of display	Green	Green
Character size	8.8(H) × 5.5(W) mm	12(H) × 6(W) mm
Font	Dot matrix (5×7)	7 segments

② Customer display

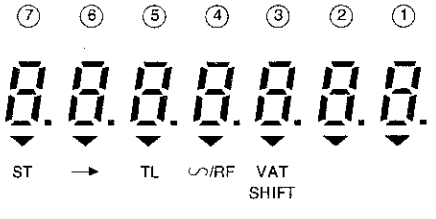


Fig. 4-2

No. of positions	7
Color of display	Green
Character size	13(H) × 6(W) mm
Font	7 segments

2) Display contents

Dot display

Display contents	Position	Description
Entry data	16-5	Numerical value and characters
Item name, etc	16-5	Department text, PLU text, etc.
Error message	16-5	Message to indicate an error
Machine state	4-1	Mode and various kinds of symbol guidance

7 seg. display

Display contents	Position	Description
Amount	8-1	Character pattern
No. of repeats	11	The number of repeats starts with "2". When the number of repeats is 10 or more, the first digit alone is displayed.
Minus sign	9-4	The floating minus sign "–" is displayed.
Sentinel	11	The decimal point appears when the cash in drawer amount exceeds a programmed sentinel amount.

3) Lamp (▼ comes on)

Display contents	Description
CCD	The lamp lights up during the execution of compulsory cash/cheque declaration
G.C. COPY	The lamp is on while the machine is in the GUEST CHECK COPY mode.
∽ / RF	The lamp lights up when a void entry or refund entry are made.
TL	The lamp lights up when a transaction is finalized.
→	The lamp lights up when change amount is displayed after tendering.
ST	The lamp lights up when each subtotal is displayed.
LEVEL 2	The lamp lights up when the PLU price level is 2.
LEVEL 3	The lamp lights up when the PLU price level is 3.
STOCK	The lamp lights up when a PLU whose stock is negative is entered.
RCPT SHIFT	The lamp lights up when the receipt shift key is pressed.
VAT SHIFT	The lamp lights up when the VAT SHIFT key is pressed.

4) Machine state symbols

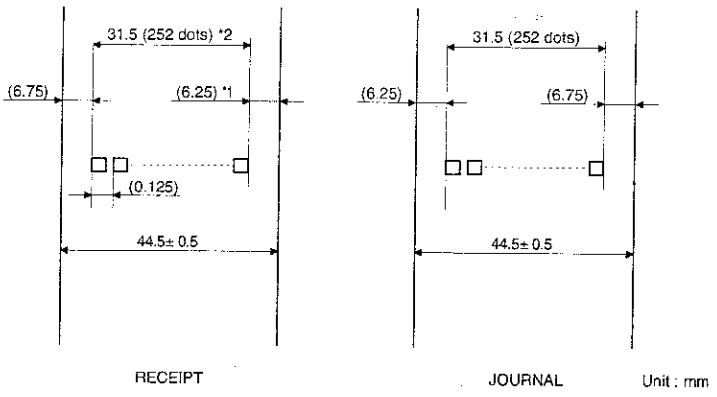
Display	Description
No. display	REG, ⏻ and (SRV') mode
MGR.	MANAGER mode
VOID	VOID mode
SRV.	SERVICE mode
PGM1	PGM1 mode
PGM2	PGM2 mode
0001	Clerk code appears when the clerk assignment system is the real clerk key, push-button clerk key or clerk code system.
OPXZ	OP X/Z mode; this symbol appears except for the above case.
X / Z1	X1 / Z1 mode
X / Z2	X2 / Z2 mode
VAL	Compulsory validation printing
SLIP	Compulsory slip printing
#	Compulsory non-add code entry
LOCK	No cashier is specified

5. Printer (M-T245)

1) Specifications

- Part number: M-T245
- No. of stations: 2 (Receipt and journal)
- Validation: No
- Printing system: Line thermal
- No. of dot: Receipt – 256 dots
Journal – 256 dots
- Dot pitch: Horizontal 0.125 mm
Vertical 0.125 mm
- Font: 12 dots(W) × 24 dots(H)
Include space between characters. (2 dots)
- Character size: 1.25 mm × 3.0 mm
- Print pitch: Column distance 1.5 mm
Row distance 3.75 mm
- Printing capacity: Receipt – 21 characters
Journal – 21 characters
- Print speed: 13 line/sec.
- Paper feed speed: 7.3 line/sec.
- Reliability: MCBF – 5 million lines (12 × 24 font)
- Cutter reliability: Life – 3.3 x 10^5 cuts
- Paper end sensor: Set up (Receipt and Journal)
- Auto cutter: Set up (Full and partial cut)
- Journal near end sensor: Service route option

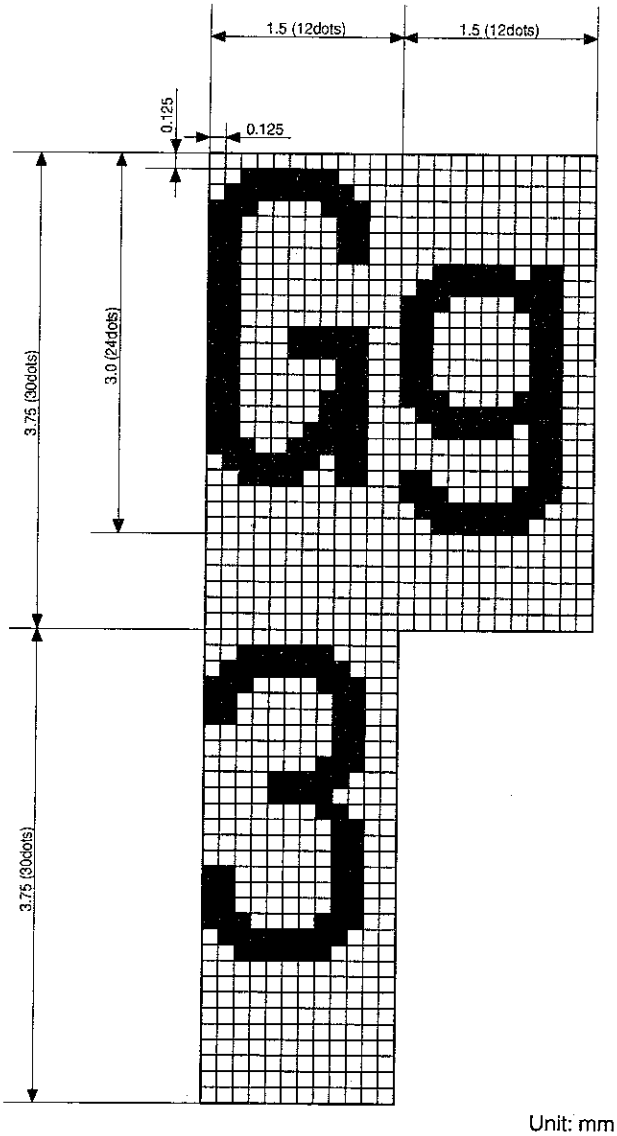
2) Printing area



*1) Logo print: (5.75)
*2) Logo print: 32 (256 dots)

3) Print format

12 × 24 font



Unit: mm

4) Supplement

- Releasing of the printer error state during printing.

① When the paper on the thermal-head is empty, the printing stalls, the message "PAPER EMPTY" is displayed, and key entries can not be accepted.
In that case, following operations will release that state.
1. Insert the roll paper and feed it to the proper position.
2. Press the CL key. Then the printer prints the error symbol (same as the power failure symbol) and resumes printing.

② When the thermal-head heads up, the printing stalls, the message "HEAD UP" is displayed, and key entries can not be accepted.
In that case, following operations will release that state.
1. Replace the thermal-head to the correct position.
2. Press the CL key. Then the printer prints the error symbol (same as the power failure symbol) and resumes printing.

③ When the printer error by the paper jumbling or the other reasons occurs, the printing stalls, intermitten bleeping starts, and key entries can not be accepted.
In that case, following operations will release the printer error state.
1. Switch off the Power Switch.
2. Repair the paper jumbling or the other reasons.
3. Switch on the Power Switch. Then the message "PRINTER ERROR" is displayed.
4. Feed the roll paper to the proper position.
5. Press the CL key. Then the printer prints the power failure symbol and resumes printing.

5) Paper

- Paper roll dimensions: 44.5±0.5mm in width, 80mm in diameter
- Paper quality: Heat sensitive paper (Paper thickness: 65±5μm)

6) Logo print

- Print: Receipt only
- Size: Max. 32 mm (256 dots) × 17 mm (136 dots)

CHAPTER 2. OPTIONS

1. System configuration

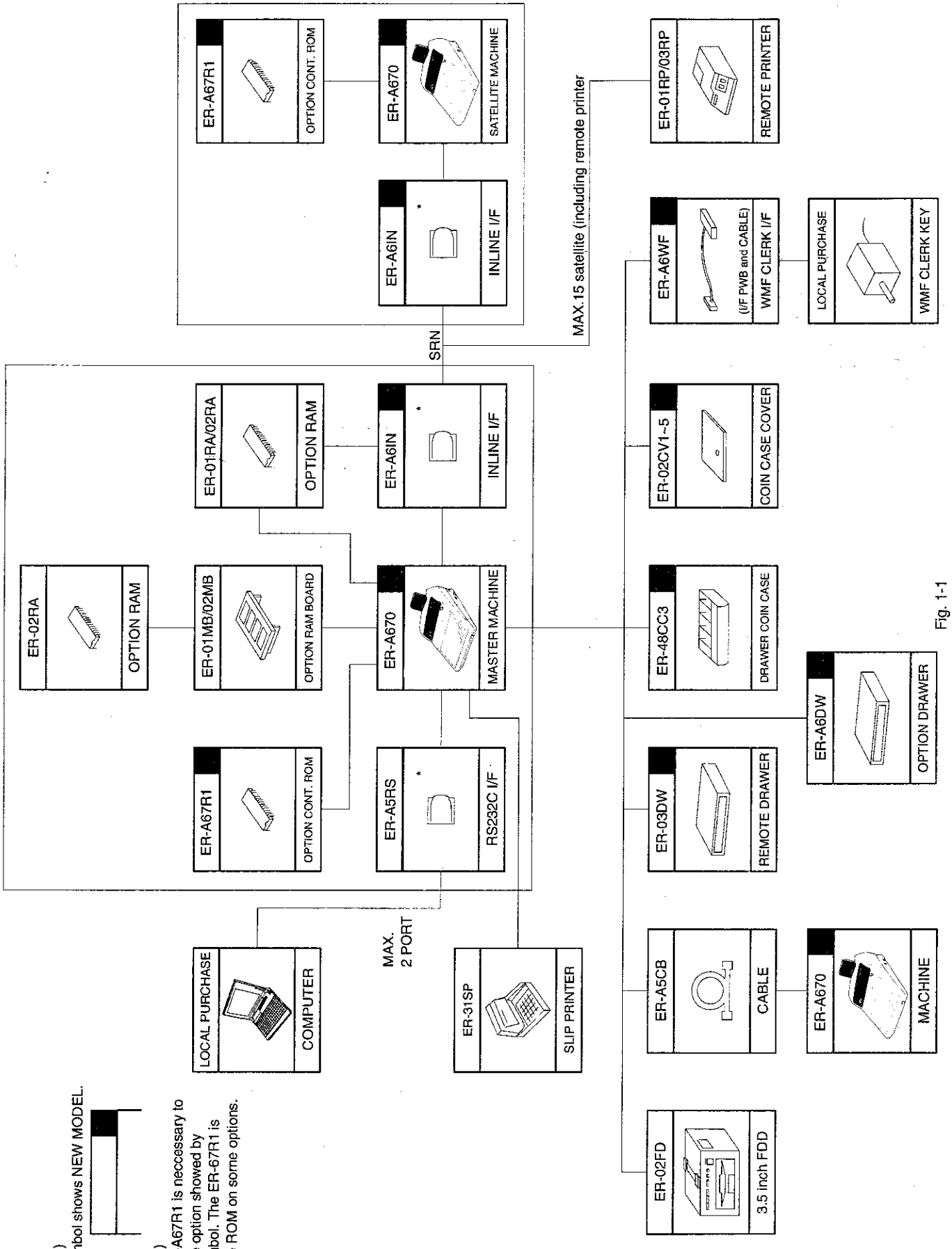


Fig. 1-1

2. Options

NO	NAME	MODEL	DESCRIPTION
1	REMOTE PRINTER	ER-01RP	Via SRN I/F (ER-A6IN)
		ER-03RP	
2	OPTION DRAWER	ER-A6DW	4B/8C
3	REMOTE DRAWER	ER-03DW	4B/8C, MAX. 3 units
4	COIN CASE	ER-48CC3	4B/8C
5	COIN CASE COVER	ER-02CV1~5	For ER-48CC3
6	EXPANSION RAM CHIP	ER-01RA	32K bytes RAM chip
		ER-02RA	128K bytes RAM chip
7	EXPANSION MEMORY BOARD	ER-01MB	128K bytes memory board with 3 IC sockets (For ER-02RA)
		ER-02MB	1M bytes memory board
8	IN-LINE SYSTEM	ER-A6IN	SRN inline I/F
9	ON-LINE SYSTEM	ER-A5RS	2ports RS-232 I/F
10	CONTROL ROM	ER-A67R1	Control for ER-A6IN, ER-A5RS
11	PRESETS LOADER	ER-02FD	FD unit
12	CONNECTION CABLE	ER-A5CB	Loader cable
13	SLIP PRINTER	ER-31SP	
14	WMF CLERK I/F	ER-A6WF	

3. Service options

NO.	NAME	PARTS CODE	PRICE RANK	DESCRIPTION
1	SERVICE KEY	LKGIM7113RCZZ	AK	For the mode switch
2	DRIP-PROOF SWITCH COVER	GCOVB7047RCZZ	BA	
3	MODE KEY GRIP COVER	LKGIM7126RCZZ	AL	OP key only
4	BLANK KEY SHEET	PSHEK6777RCZZ	AC	
5	JOURNAL NEAR END SENSOR	DKIT-8643RCZZ	BG	
6	ADDITIONAL CLERK KEY	LKGIM7346RCZZ	AX	Key No. = 7
		LKGIM7347RCZZ	AX	Key No. = 8
		LKGIM7348RCZZ	AX	Key No. = 9
		LKGIM7349RCZZ	AX	Key No. = 10
		LKGIM7350RCZZ	AX	Key No. = 11
		LKGIM7351RCZZ	AX	Key No. = 12
		LKGIM7352RCZZ	AX	Key No. = 13
		LKGIM7353RCZZ	AX	Key No. = 14
		LKGIM7354RCZZ	AX	Key No. = 15
7	DRAWER FIXING KIT	DKIT-8633RCZZ	BE	

4. Service tools

NO.	NAME	PARTS CODE	PRICE RANK
1	EXPANSION PWB	CKOG-6708RCZZ	BU
2	SIO LOOP BACK CONECTOR	UKOG-6704RCZZ	AV

5. Supplies

NO.	NAME	PARTS CODE	PRICE RANK	DESCRIPTION
1	ROLL PAPER	TPAPR6645RC05	AY	5rolls/pack
2	KEY SHEET	PSHEK6804RCZZ	AD	Programming character sheet
		PSHEK6796RCZZ	AK	Standard character sheet
		PSHEK6777RCZZ	AC	Blank character sheet

6. Options

For installation of the options, refer to the Installation Manual which is separately issued from this manual.

7. How to use service tools

7-1. SIO loop back connector: UKOG-6704RCZZ

- External view

Signal	Pin
GND	1
$\overline{ER}$	2
$\overline{DR}$	3
RXD	4
TXD	5
$\overline{CD}$	6
$\overline{RR}$	7
$\overline{CS}$	8
$\overline{RS}$	9

N.C

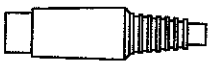


Fig. 7-1

- Purpose: Used for "SIO Test 1 (SIO loop back test)."
- Installation view:

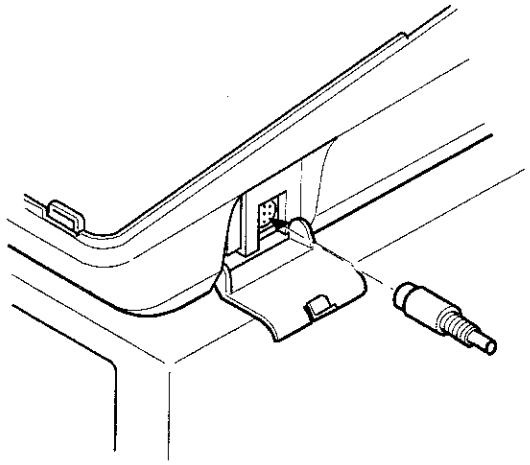


Fig. 7-2

- How to use: Connect the UKOG-6704RCZZ to the body and perform the following key operations:

  SRV mode: 117 → TL

7-2. Expansion PWB: CKOG-6708RCZZ

- External view

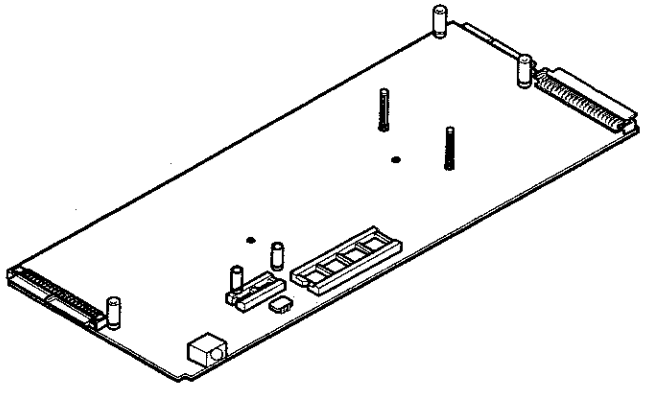


Fig. 7-3

Purpose 1: Used for servicing and repairing of options (such as the ER-A6IN and the ER-A5RS) which are connected with the main body option connector.

[Procedure 1]
Use an insulator base as that in Fig. 7-4 (shaded section) and perform servicing.

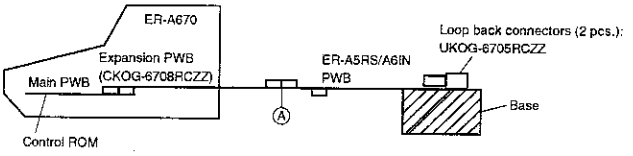


Fig. 7-4

To check the option I/F PWB from the solder side, connect the I/F PWB to OPTCN2. To check from the parts side, connect to OPTCN3.

(Note) The option I/F PWB should be held horizontally so that no excessive stress is applied to connecting section Ⓐ in Fig. 7-4.

[Procedure 2]

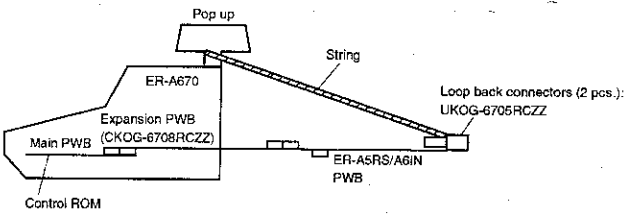


Fig. 7-5

As shown in Fig. 7-5, put a string between the pop up and the option PWB angle and adjust the length of the string so that the CKOG-6708RCZZ and the option PWB. Then perform servicing.

Purpose 2: The CKOG-6708RCZZ is equipped with the loop back connector for checking the ER-A5CB (SIO cable) cable operations.

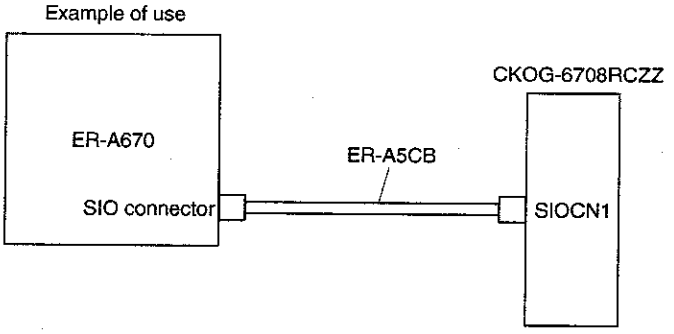


Fig. 7-6

Checking procedure

1) Connect the ER-A5CB between an ECR body and the CKOG-6708RCZZ SIOCN1. (The SIO functions of the ECR must be normal.)
2) Perform test function "117 (SIO loop back test)" and judge it normal or abnormal.

CHAPTER 3. SRV. RESET AND MASTER RESET

1. SRV. reset (Program Loop Reset)

Used to return the machine back to its operational state after a lock-up has occurred.

Procedure

- Method 1
  1) Turn off the AC switch.
  2) Set the mode switch to (SRV') position.
  3) Turn on the AC switch.
  4) Turn to (SRV) position from (SRV') position.
- Method 2
  1) Set the mode switch to PGM2 position.
  2) Turn off the AC switch.
  3) While holding down JOURNAL FEED key and RECEIPT FEED key, Turn on the AC switch.

Note: When disassembling and reassembling always power up using method 1 only. Method 2 will not reset the CKDC4.

Note: SRV programming job#926-B must be set to "4" to allow PGM program loop reset.

2. Master reset (All memory clear)

There are two possible methods to perform a master reset.

- MRS-1

Used to clear all memory contents and return machine back to its initial settings. return keyboard back to default. for default keyboard layout.

Procedure

1) Turn off the AC switch.
2) Set the MODE switch to the (SRV') position.
3) Turn on the AC switch.
4) While holding down JOURNAL FEED key, turn to (SRV) position from (SRV') position.

- MRS-2

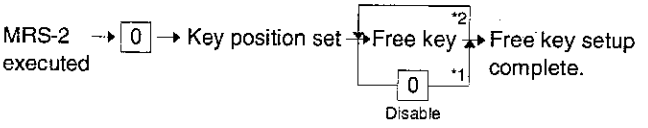
  Used to clear all memory and keyboard contents.
  This reset returns all programming back to defaults. The keyboard must be entered by hand.
  This reset is used if an application needs different keyboard layout other than that supplied by a normal MRS-1.

Procedure

1) Turn off the AC switch.
2) Set the MODE switch to the (SRV') position.
3) Turn on the AC switch.
4) While holding down JOURNAL FEED key and RECEIPT FEED key, turn to (SRV) position from (SRV') position.
5) Key position assignment:

* After the execution of MRS-2, only the RECEIPT FEED and JOURNAL FEED keys can remain effective on key assignment. Any key can be assigned on any key position on the main keyboard.

[key setup procedure]



NOTES:

*1: When the 0 key is pressed, the key of the key number on display is disabled.

*2: Push the key on the position to be assigned. With this, the key of the key number on display is assigned to that key position.

*3: When relocating the keyboard, the PGM 1/2 use standard key layout.

Key number	Key name	Key number	Key name
1	Numeric key "0"	10	Numeric key "9"
2	Numeric key "1"	11	Numeric key "00"
3	Numeric key "2"	12	Numeric key "000"
4	Numeric key "3"	13	Decimal point key
5	Numeric key "4"	14	CL key
6	Numeric key "5"	15	⊗ key
7	Numeric key "6"	16	ST key
8	Numeric key "7"	17	TL key
9	Numeric key "8"		

CHAPTER 4. HARD WARE DESCRIPTION

1. Hard ware block diagram

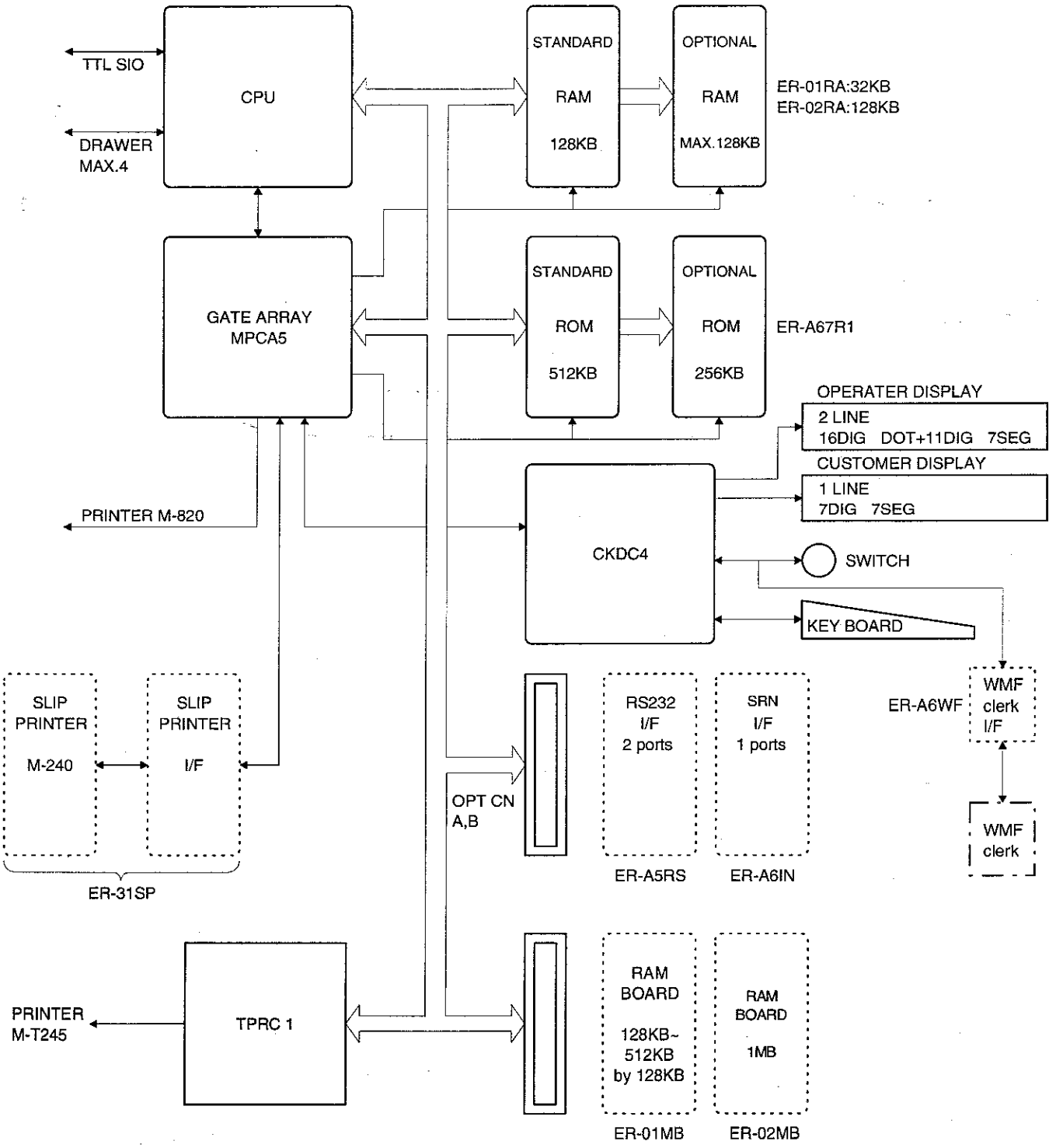
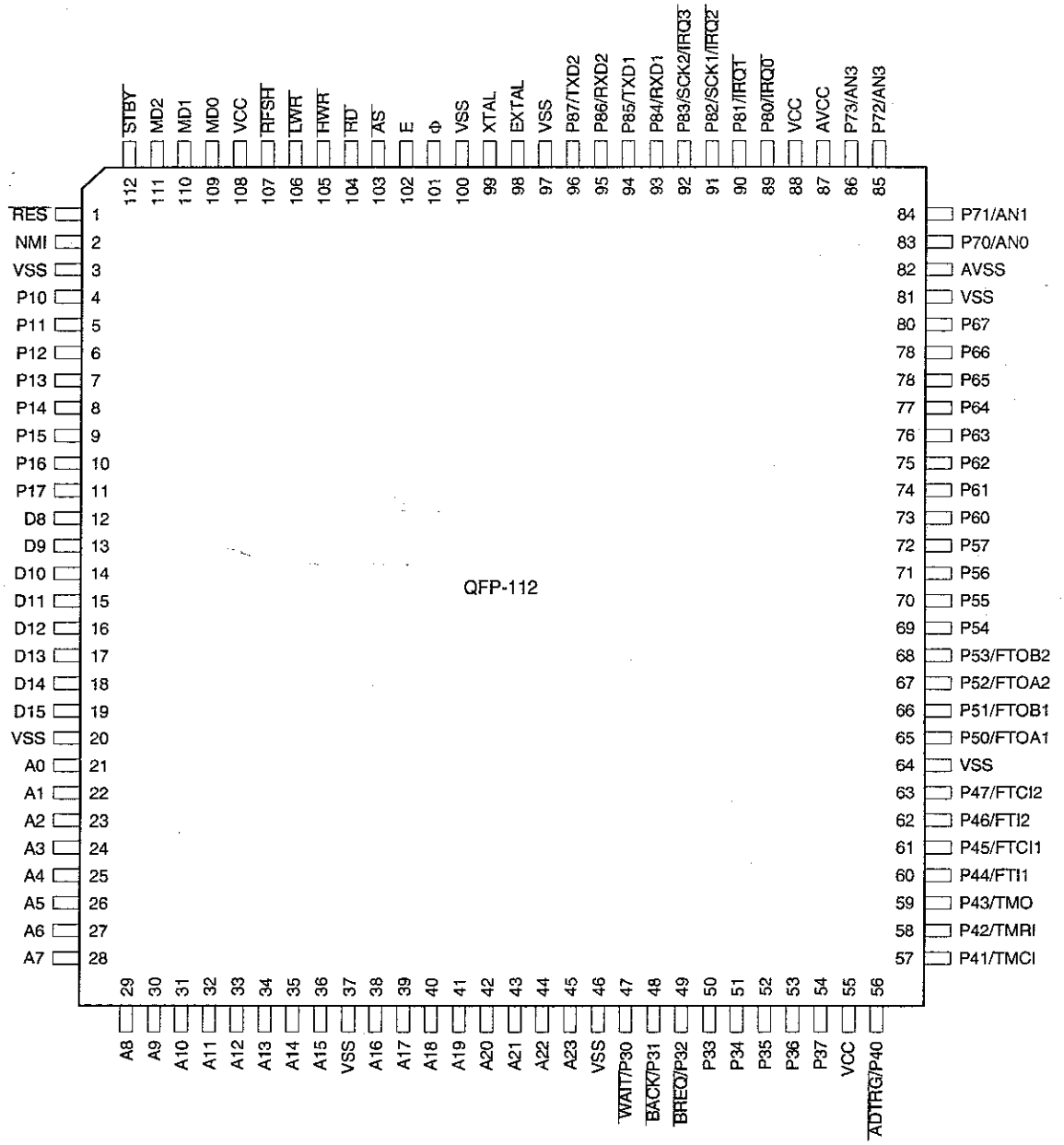


Fig. 1-1

2. Description of main LSI's

2-1. CPU (HD6415108FX)

1) Pin configuration



HD6415108FX pin configuration

Fig. 2-1

2) Block diagram

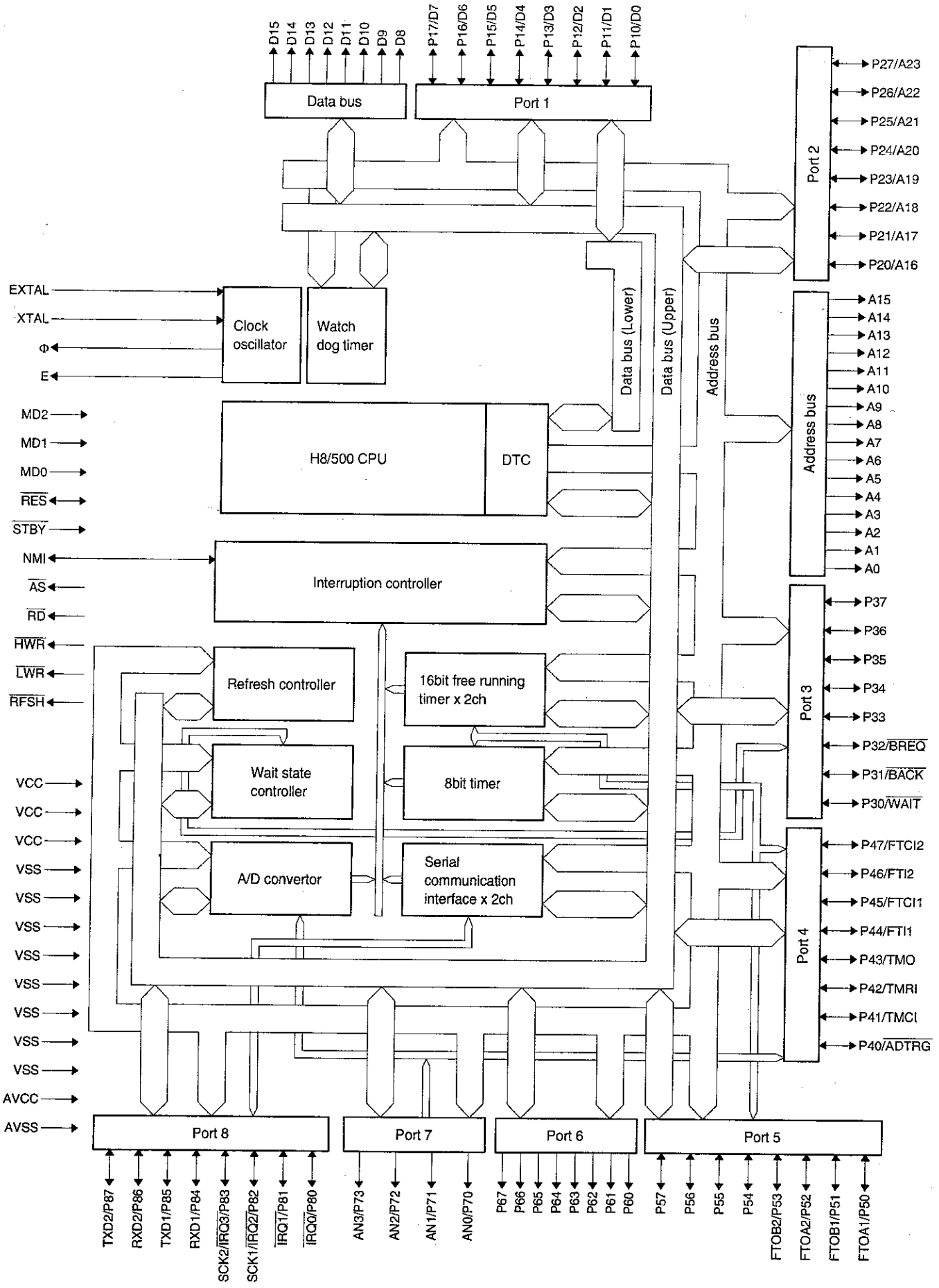


Fig. 2-2

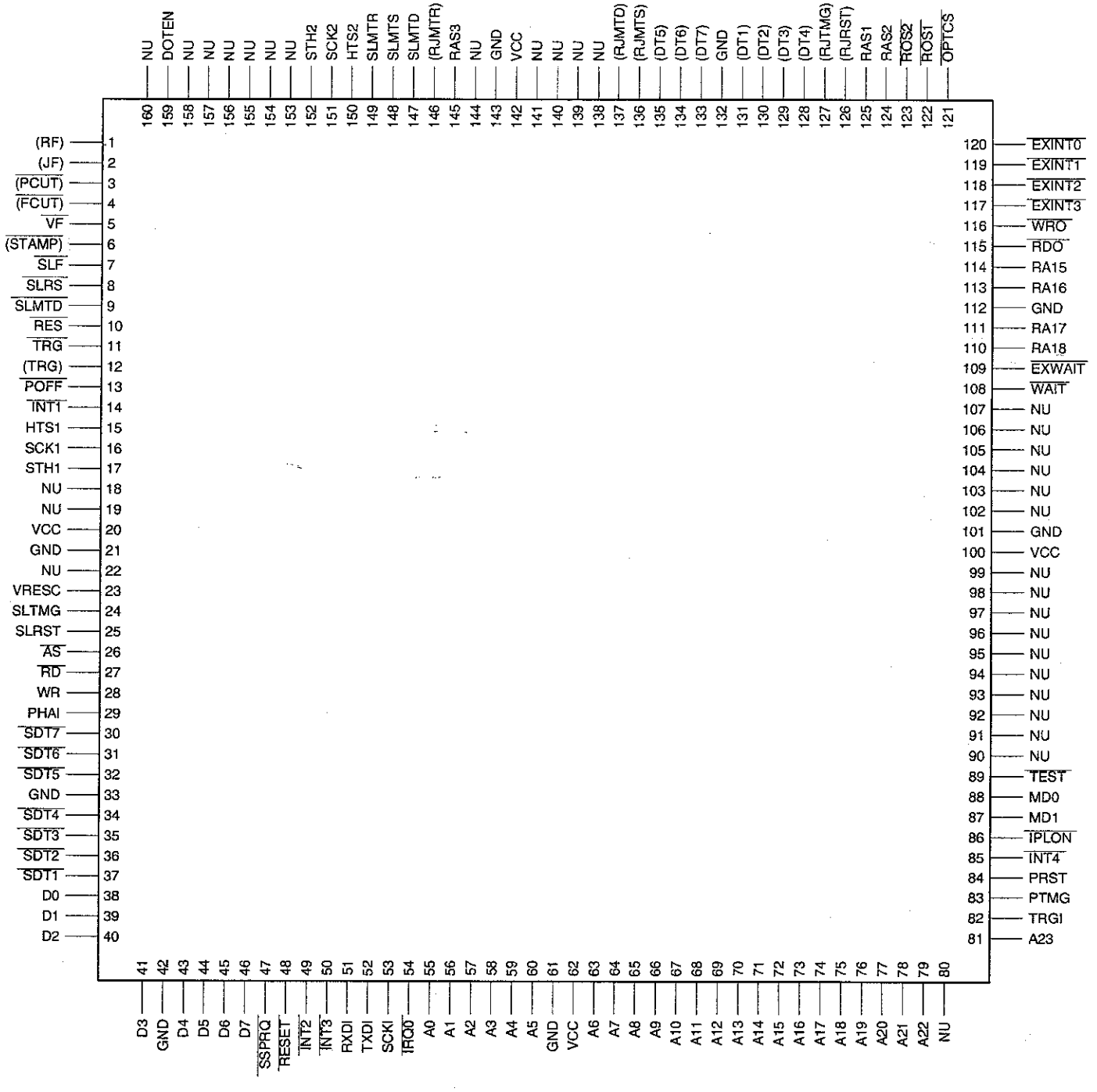
3) Pin description

Pin No.	Symbol	Signal name	In/ Out	Function
1	$\overline{RES}$	$\overline{RESET}$	I/O	Reset input
2	NMi	NMi	In	Non-maskable interrupt input for SSP interrupt input.
3	VSS	VSS	In	GND
4	P10	D0	In	GND
5	P11	D1	In	GND
6	P12	D2	In	GND
7	P13	D3	In	GND
8	P14	D4	In	GND
9	P15	D5	In	GND
10	P16	D6	In	GND
11	P17	D7	In	GND
12	D8	D0	I/O	Data bus
13	D9	D1	I/O	Data bus
14	D10	D2	I/O	Data bus
15	D11	D3	I/O	Data bus
16	D12	D4	I/O	Data bus
17	D13	D5	I/O	Data bus
18	D14	D6	I/O	Data bus
19	D15	D7	I/O	Data bus
20	VSS	VSS	In	GND
21	A0	A0	Out	Address bus
22	A1	A1	Out	Address bus
23	A2	A2	Out	Address bus
24	A3	A3	Out	Address bus
25	A4	A4	Out	Address bus
26	A5	A5	Out	Address bus
27	A6	A6	Out	Address bus
28	A7	A7	Out	Address bus
29	A8	A8	Out	Address bus
30	A9	A9	Out	Address bus
31	A10	A10	Out	Address bus
32	A11	A11	Out	Address bus
33	A12	A12	Out	Address bus
34	A13	A13	Out	Address bus
35	A14	A14	Out	Address bus
36	A15	A15	Out	Address bus
37	VSS	VSS	In	GND
38	A16	A16	Out	Address bus
39	A17	A17	Out	Address bus
40	A18	A18	Out	Address bus
41	A19	A19	Out	Address bus
42	A20	A20	Out	Address bus
43	A21	A21	Out	Address bus
44	A22	A22	Out	Address bus
45	A23	A23	Out	Address bus
46	VSS	VSS	In	GND
47	$\overline{WAIT}$	$\overline{WAIT}$	In	Wait signal
48	$\overline{BACK}$	$\overline{BACK}$	Out	Bus control request acknowledge
49	$\overline{BREQ}$	$\overline{BREQ}$	In	Bus control request
50	P33	DOPS	In	Drawer open signal
51	P34	$\overline{DR0}$	Out	Option drawer open signal
52	P35	$\overline{DR1}$	Out	Remote drawer No.1 open signal
53	P36	$\overline{DR2}$	Out	Remote drawer No.2 open signal
54	P37	$\overline{DR3}$	Out	Remote drawer No.3 open signal
55	VCC	VCC	In	+5V
56	P40	$\overline{IFV}$	In	Nu
57	P41	$\overline{PTMG}$	In	Printer (M-T245) timing signal
58	P42	$\overline{TOF}$	In	Nu
59	P43	$\overline{BOF}$	In	Nu
60	P44	$\overline{PRST}$	In	Printer (M-T245) reset signal
61	P45	$\overline{NEJ}$	In	Near end sensor journal side
62	P46	$\overline{SHEN}$	In	CKDC Interface shift enable signal
63	P47	$\overline{NER}$	In	Nu
64	VSS	VSS	In	+5V
65	P50	TRGI	Out	Dot pulse adjust signal
66	P51	$\overline{PSTOP}$	Out	Nu
67	P52	$\overline{CKDCR2}$	Out	Nu
68	P53	OPDS	In	Nu
69	P54	FVPON	Out	Nu
70	P55	FMRS	In	Nu
71	P56	$\overline{SLIPLMP}$	Out	Nu
72	P57	$\overline{STOP}$	Out	System reset output. Normally
73	P60	$\overline{ER}$	Out	SIO control signal (Equipment ready)
74	P61	$\overline{DR}$	In	SIO control signal (Data set ready)
75	P62	$\overline{CS}$	In	SIO control signal (Clear to send)
76	P63	$\overline{CD}$	In	SIO control signal (Carrier detect)
77	P64	$\overline{RR}$	Out	SIO control signal (Ready to receive)
78	P65	$\overline{RS}$	Out	SIO control signal (Request to send)
79	P66	$\overline{CI}$	In	Nu
80	P67	—	In	Nu
81	VSS	VSS	In	GND
82	AVSS	AVSS	In	Nu
83	P70	VPJ/VPT	In	Validation sensor journal/top
84	P71	VPR/VPB	In	Validation sensor receipt/bottom
85	P72	VPTEST	In	+24V test input
86	P73	$\overline{VPPS}$	In	Validation sense signal
87	AVCC	AVCC	In	Nu
88	VCC	VCC	In	+5V
89	P80	$\overline{IRQ0}$	In	Interrupt signal 0
90	P81	$\overline{IRQ1}$	In	Interrupt signal 1
91	P82	$\overline{IR02}$	In	Interrupt signal 2
92	P83	SCK	In	CKDC Interface sync shift clock
93	P84	RXD	In	SIO control signal (Receive data)
94	P85	TXD	Out	SIO control signal (Transmit data)

Pin No.	Symbol	Signal name	In/ Out	Function
95	P86	STH	In	CKDC Interface shift input data
96	P87	HTS	Out	CKDC Interface shift output data
97	VSS	VSS	In	GND
89	EXTAL	EXTAL	In	9.8304MHZ crystal oscillator connection
99	XTAL	XTAL	In	9.8304MHZ crystal oscillator connection
100	VSS	VSS	In	GND
101	ϕ	ϕ	Out	System clock
102	E	E	Out	Nu
103	$\overline{AS}$	$\overline{AS}$	Out	Address strobe
104	$\overline{RD}$	$\overline{RD}$	Out	Read
105	$\overline{HWR}$	$\overline{WR}$	Out	Write
106	$\overline{LWR}$	$\overline{LWR}$	Out	Nu
107	$\overline{RFSH}$	$\overline{RFSH}$	Out	Refresh cycle
108	VCC	VCC	In	+5V
109	MD0	MD0	In	+5V (MODE 3)
110	MD1	MD1	In	+5V (MODE 3)
111	MD2	MD2	In	GND
112	$\overline{STBY}$	$\overline{STBY}$	In	+5V (Nu)

2-2. G.A (MPCA5)

1) Pin configuration



GATE ARRAY (F258016PC)
MPCA5

Fig. 2-3

2) Block diagram

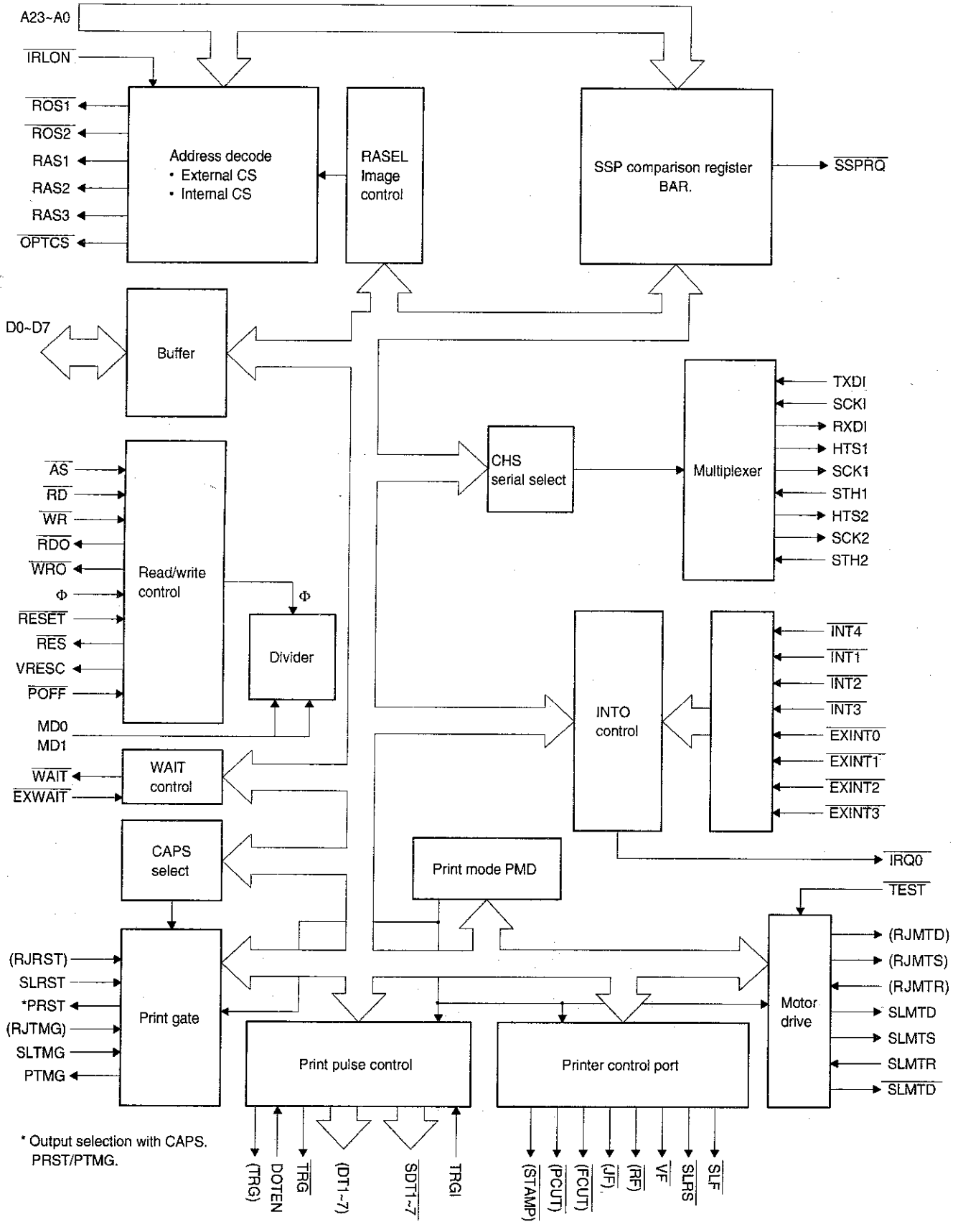


Fig. 2-4

3) Pin description

Pin No.	Signal name	In/ Out	Function
1	RF	Out	Nu
2	JF	Out	Nu
3	$\overline{PCUT}$	Out	Not used
4	$\overline{FCUT}$	Out	Not used
5	$\overline{VF}$	Out	Not used
6	$\overline{STAMP}$	Out	Nu
7	$\overline{SLFS}$	Out	Slip printer (M-240) paper feed singnal
8	$\overline{SLRS}$	Out	Slip printer (M-240) release signal
9	$\overline{SLMTD}$	Out	Slip printer (M-240) motor drive signal
10	$\overline{RES}$	Out	Peripheral output reset
11	$\overline{TRG}$	Out	Dot head trigger signal (M-240)
12	TRG	Out	Nu
13	$\overline{POFF}$	In	Interrupt input
14	$\overline{INT1}$	In	Interrupt signal (Key interrupt request)
15	HTS1	Out	8 bit serial port output
16	SCK1	Out	Serial port shift clock output
17	STH1	In	8 bit serial port input
18	—	—	Nu
19	—	—	Nu
20	VCC	—	+5V
21	GND	—	GND
22	—	—	Nu
23	VRESC	Out	Turns active when reset and power down is met
24	SLTMG	In	Slip printer timing signal
25	SLRST	In	Slip printer reset signal
26	$\overline{AS}$	In	Address strobe
27	$\overline{RD}$	In	Read strobe
28	$\overline{WR}$	In	Write strobe
29	ϕ	In	(ϕ) System clock
30	$\overline{SDT7}$	Out	Printhead drive signal (dot7)
31	$\overline{SDT6}$	Out	Printhead drive signal (dot6)
32	$\overline{SDT5}$	Out	Printhead drive signal (dot5)
33	GND	—	GND
34	$\overline{SDT4}$	Out	Printhead drive signal (dot4)
35	$\overline{SDT3}$	Out	Printhead drive signal (dot3)
36	$\overline{SDT2}$	Out	Printhead drive signal (dot2)
37	$\overline{SDT1}$	Out	Printhead drive signal (dot1)
38	D0	I/O	Data bus
39	D1	I/O	Data bus
40	D2	I/O	Data bus
41	D3	I/O	Data bus
42	GND	—	GND
43	D4	I/0	Data bus
44	D5	I/0	Data bus
45	D6	I/0	Data bus
46	D7	I/0	Data bus
47	$\overline{SPRQ}$	Out	SSP interrupt request
48	$\overline{RESET}$	In	MPCA5 reset
49	$\overline{INT2}$	In	Interrupt signal (Nu)
50	$\overline{INT3}$	In	Interrupt signal (Nu)
51	RXDI	Out	8 bit serial port output to CPU
52	TXDI	In	8 bit serial port input from CPU
53	SCKI	In	Serial port shift clock input from CPU.
54	$\overline{IRQ0}$	Out	Interrupt request to CPU

Pin No.	Signal name	In/ Out	Function
55	A0	In	Address bus
56	A1	In	Address bus
57	A2	In	Address bus
58	A3	In	Address bus
59	A4	In	Address bus
60	A5	In	Address bus
61	GND	—	GND
62	VCC	—	+5V
63	A6	In	Address bus
64	A7	In	Address bus
65	A8	In	Address bus
66	A9	In	Address bus
67	A10	In	Address bus
68	A11	In	Address bus
69	A12	In	Address bus
70	A13	In	Address bus
71	A14	In	Address bus
72	A15	In	Address bus
73	A16	In	Address bus
74	A17	In	Address bus
75	A18	In	Address bus
76	A19	In	Address bus
77	A20	In	Address bus
78	A21	In	Address bus
79	A22	In	Address bus
80	—	—	Nu
81	A23	In	Address bus
82	TRGI	In	Dot pulse control/drive signal
83	$\overline{PTMG}$	Out	Printer timing signal
84	$\overline{PRST}$	Out	Printer reset signal
85	$\overline{INT4}$	In	Interrupt signal
86	$\overline{IPLON}$	In	Nu
87	MD1	In	Mode select input
88	MD0	In	Mode select input
89	$\overline{TEST}$	In	Nu
90	—	—	Nu
91	—	—	Nu
92	—	—	Nu
93	—	—	Nu
94	—	—	Nu
95	—	—	Nu
96	—	—	Nu
97	—	—	Nu
98	—	—	Nu
99	—	—	Nu
100	VCC	—	+5V
101	GND	—	GND
102	—	—	Nu
103	—	—	Nu
104	—	—	Nu
105	—	—	Nu
106	—	—	Nu
107	—	—	Nu
108	$\overline{WAIT}$	Out	Wait request signal

Pin No.	Signal name	In/ Out	Function	
109	$\overline{\text{EXWAIT}}$	In	External wait control input signal	
110	RA18	Out	Nu	
111	RA17	Out	Nu	
112	GND	—	GND	
113	RA16	Out	Nu	
114	RA15	Out	Nu	
115	$\overline{\text{RDO}}$	Out	Expansion RD signal	Option
116	$\overline{\text{WRO}}$	Out	Expansion WR signal	
117	$\overline{\text{EXINT3}}$	In	Expansion interruption signal 3	Option
118	$\overline{\text{EXINT2}}$	In	Expansion interruption signal 2	
119	$\overline{\text{EXINT1}}$	In	Expansion interruption signal 1	
120	$\overline{\text{EXINT0}}$	In	Expansion interruption signal 0	
121	$\overline{\text{OPTCS}}$	Out	Chip select base signal for expansion option	
122	$\overline{\text{ROS1}}$	Out	ROM 1 chip select signal	
123	$\overline{\text{ROS2}}$	Out	ROM 2 chip select signal	
124	RAS2	Out	RAM 2 chip select signal	
125	RAS1	Out	RAM 1 ship select signal	
126	RJRST	In	Nu	
127	RJTMG	In	Nu	
128	DT4	Out	Nu	
129	DT3	Out	Nu	
130	DT2	Out	Nu	
131	DT1	Out	Nu	
132	GND	—	GND	
133	DT7	Out	Nu	
134	DT6	Out	Nu	
135	DT5	Out	Nu	
136	RJMTS	Out	Nu	
137	RJMTD	Out	Nu	
138	—	—	Nu	
139	—	—	Nu	
140	—	—	Nu	
141	—	—	Nu	
142	VCC	—	+5V	
143	GND	—	GND	
144	—	—	Nu	
145	RAS3	Out	Nu	
146	RJMTR	In	Nu	
147	SLMTD	In	M240 motor lock drive signal	
148	SLMTS	In	M240 motor brake signal	
149	SLMTR	In	M240 motor lock detection signal	
150	HTS2	Out	Nu	
151	SCK2	Out	Nu	
152	STH2	In	Nu	
153	—	—	Nu	
154	—	—	Nu	
155	—	—	Nu	
156	—	—	Nu	
157	—	—	Nu	
158	—	—	Nu	
159	DOTEN	Out	Dot drive enable signal	
160	—	—	Nu	

2-3. CKDC4 (HD404728A20FS)

1) General description

The CKDC4 is a 4-bit microcomputer developed for the ER-A670 and provides functions to control the real-time clock, keys, and displays. The basic functions of the CKDC4 are shown below.

Keys: The CKDC4 is capable of controlling a maximum of 256 momentary keys. (Sharp 2-key rollover control)
Simultaneous scanning of key and switch
(When a key is scanned, the state of a mode and clerk switch is also buffered. The host can scan the state of switch together with the key entry data at the same time the key is scanned.)

Switches: Mode switch with 14 positions maximum
8-bit clerk (cashier) switch
2-bit feed switch
1-bit receipt on/off switch
1-bit option switch
4-bit general-purpose switch (1-bit is used for keyboard select)

Displays: 16-column dot display
12-column 7-segment display (column digit selectable)
All column blink controlled for the dot and 7-segment display decimal point and indicators
Programmable patterns for 7-segment display:
Four patterns
Internal driver for 7-segment display

Buzzer: Single tone control

Clock: Year, month, day of month, day of week, hour, minute

Alarm: Hour, minute

Interrupt request (event control):
Detection of key input, switch position change, alarm issue, and counter overflow

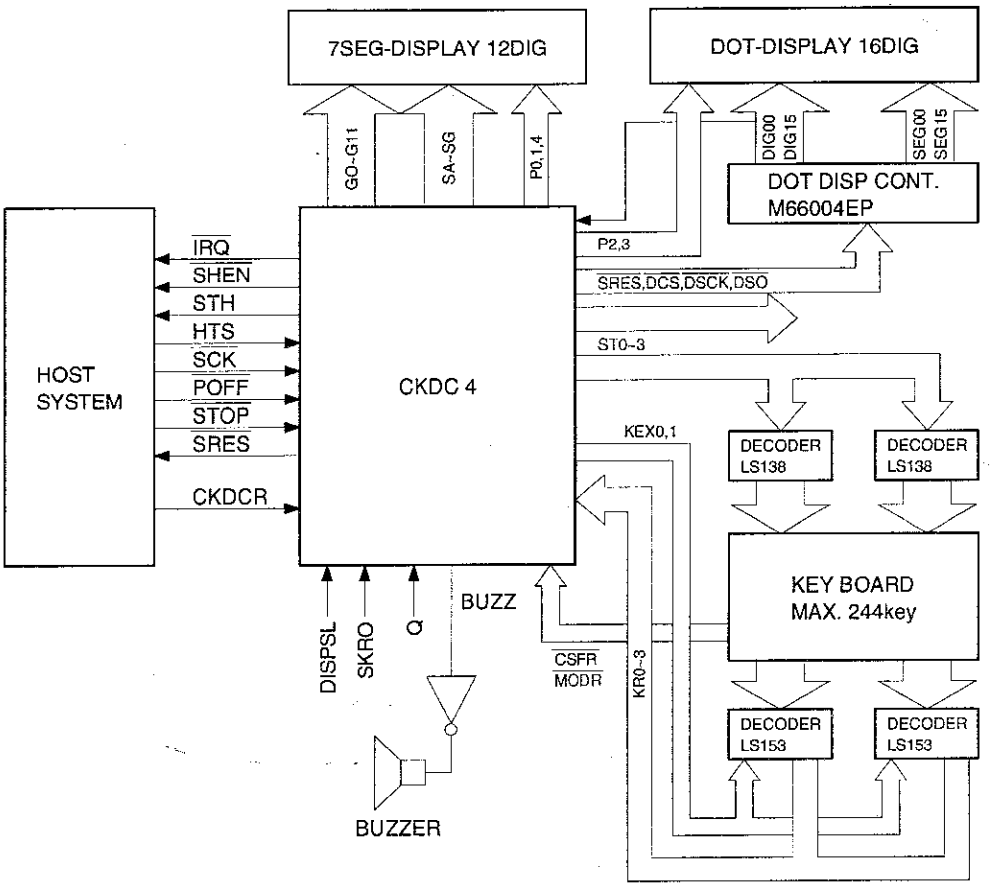


Fig. 2-5

2) Pin assignment

Pin No.	Port	I/O	RESET State	Signal name	I/O	Notes	PULL-UP -DOWN
1	$R0_1$	I/O	H-Z	SB	O	DB4 : SEG-B	PULL-DOWN
2	$R0_2$	I/O	H-Z	SC	O	DB4 : SEG-C	PULL-DOWN
3	$R0_3$	I/O	H-Z	SD	O	DB4 : SEG-D	PULL-DOWN
4	$R1_0$	I/O	H-Z	SF	O	DB4 : SEG-E	PULL-DOWN
5	$R1_1$	I/O	H-Z	SE	O	DB4 : SEG-F	PULL-DOWN
6	$R1_2$	I/O	H-Z	SG	O	DB4 : SEG-G	PULL-DOWN
7	$R1_3$	I/O	H-Z	P4	O	DB7 : 7SEG COM	PULL-DOWN
8	$R2_0$	I/O	H-Z	P0	O	DB2 : DOT DP	PULL-DOWN
9	$R2_1$	I/O	H-Z	P1	O	DB3 : DOT COM	PULL-DOWN
10	$R2_2$	I/O	H-Z	P2	O	DB5 : 7SEG DP	PULL-DOWN
11	$R2_3$	I/O	H-Z	P3	O	DB5 : 7SEG ID	PULL-DOWN
12	RA_0	I	I	$\overline{MODR}$	I	MODE RETURN	PULL-UP
13	RA_1	I	I	$\overline{CFSR}$	I	CLEARK, FEED, SWITCH RETURN	PULL-UP
14	$R3_0$	I/O	H-Z	KEX0	O	KEY EXCHANGE0	PULL-DOWN
15	$R3_1$	I/O	H-Z	KEX1	O	KEY EXCHANGE1	PULL-DOWN
16	$R3_2$	I/O	H-Z	RQ	O	INPUT Q	
17	$R3_3$	I/O	H-Z	SKR0	O	KEY SELECTO	
18	$R5_0$	I/O	I	ST0	O	KEY SCAN ST0	
19	$R5_1$	I/O	I	ST1	O	KEY SCAN ST1	
20	$R5_2$	I/O	I	ST2	O	KEY SCAN ST2	
21	$R5_3$	I/O	I	ST3	O	KEY SCAN ST3	
22	$R6_0$/INT0	I/O	I	$\overline{POFF}$	I	P-OFF	
23	$R6_1$/INT1	I/O	I	$\overline{STOP}$	I	STOP	PULL-UP
24	$R6_2$/INT2	I/O	I	$\overline{DDIG}$	O	DOT DISPLAY DIGIT INPUT	
25	$R6_3$/INT3	I/O	I	$\overline{DCS}$	O	DOT DISPLAY CONT./CS	
26	Vcc					Power supply	
27	$R4_0$/SCK	I/O	I	$\overline{SCK}$	I	SCK	
28	$R4_1$/SI	I/O	I	HTS	I	HTS	
29	$R4_2$/S0	I/O	I	STH	O	STH	
30	$R4_3$/PWM	I/O	I	SDISP	I	DIST SELECT	
31	$R7_0$/BUZZ	I/O	I	BUZZ	O	BUZZER	
32	$R7_1$/SCK2	I/O	I	$\overline{DSCK}$	O	DOT DISP CONT. SCK	
33	$R7_2$/SI2	I/O	I	$\overline{SRES}$	O	SYSTEM RESET	PULL-DOWN

Pin No.	Port	I/O	RESET State	Signal name	I/O	Notes	PULL-UP -DOWN
34	$R7_3$/S02	I/O	O	DS0	O	DOT DISP CONT. SO	
35	$R8_0$	I/O	O	$\overline{SHEN}$	O	$\overline{SHEN}$	
36	$R8_1$	I/O	O	$\overline{IRQ}$	O	$\overline{IRQ}$	
37	$R9_0$	I	I	KR0	I	KEY RETURN 0	
38	$R9_1$	I	I	KR1	I	KEY RETURN 1	
39	$R9_2$	I	I	KR2	I	KEY RETURN 2	
40	$R9_3$	I	I	KR3	I	KEY RETURN 3	
41	RESET					CKDC IV RESET	
42	OSC2						
43	OSC1						
44	GND					GND	
45	CL1						
46	CL2						
47	TEST	I	I	+5V		5V	
48	D0	I/O	H-Z	G0	O	7 SEG DIG 0	PULL-DOWN
49	D1	I/O	H-Z	G1	O	7 SEG DIG 1	PULL-DOWN
50	D2	I/O	H-Z	G2	O	7 SEG DIG 2	PULL-DOWN
51	D3	I/O	H-Z	G3	I	7 SEG DIG 3	PULL-DOWN
52	D4	I/O	H-Z	G4	O	7 SEG DIG 4	PULL-DOWN
53	D5	I/O	H-Z	G5	O	7 SEG DIG 5	PULL-DOWN
54	D6	I/O	H-Z	G6	O	7 SEG DIG 6	PULL-DOWN
55	D7	I/O	H-Z	G7	O	7 SEG DIG 7	PULL-DOWN
56	D8	I/O	H-Z	G8	O	7 SEG DIG 8	PULL-DOWN
57	D9	I/O	H-Z	G9	O	7 SEG DIG 9	
58	D10	I/O	H-Z	G10	O	7 SEG DIG 10	
59	D11	I/O	H-Z	G11	O	7 SEG DIG 11	
60	D12	I/O	H-Z	P00	O		
61	D13	I/O	H-Z	P010	O		
62	D14	I/O	H-Z	P02	O		
63	D15	I/O	H-Z	P03	O		
64	$R0_0$	I/O	H-Z	SA	O	DB4 : SEG-A	PULL-DOWN

NOTE 3: Pull-up/down in the table indicates that the lines concerned require external pull-up/down resistance.

2-4. TPRC1 (F258024PC)

1) General

TPRC1 is the LSI circuit of the peripheral circuits of the microcomputer required for thermal printer control.

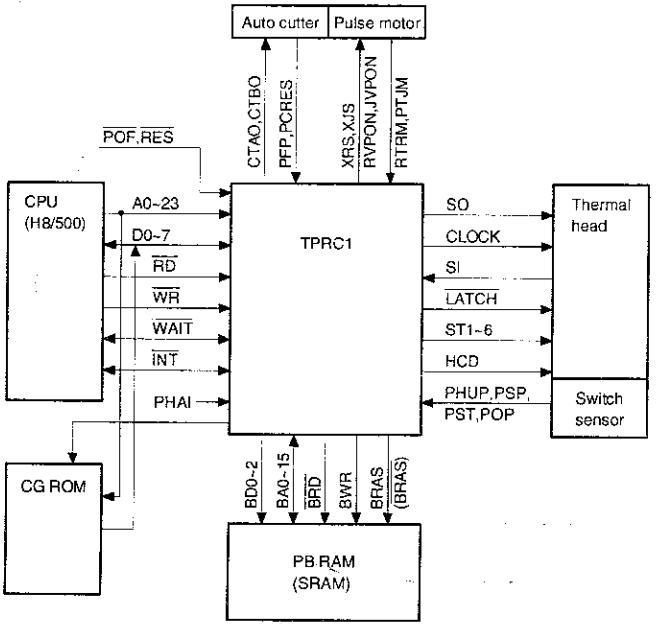


Fig. 2-6

The CPU is designed for use with H8/500. The bus I/F, however, is not restricted to the design concept.
The printer is designed mainly for use with TM-245. However, the thermalhead composition (the dot number and the block number) is rather flexible.

1. Auto cutter
2. Pulse motor
3. Thermalhead
4. Switch
5. Fig.5 System composition

2) Pin configuration

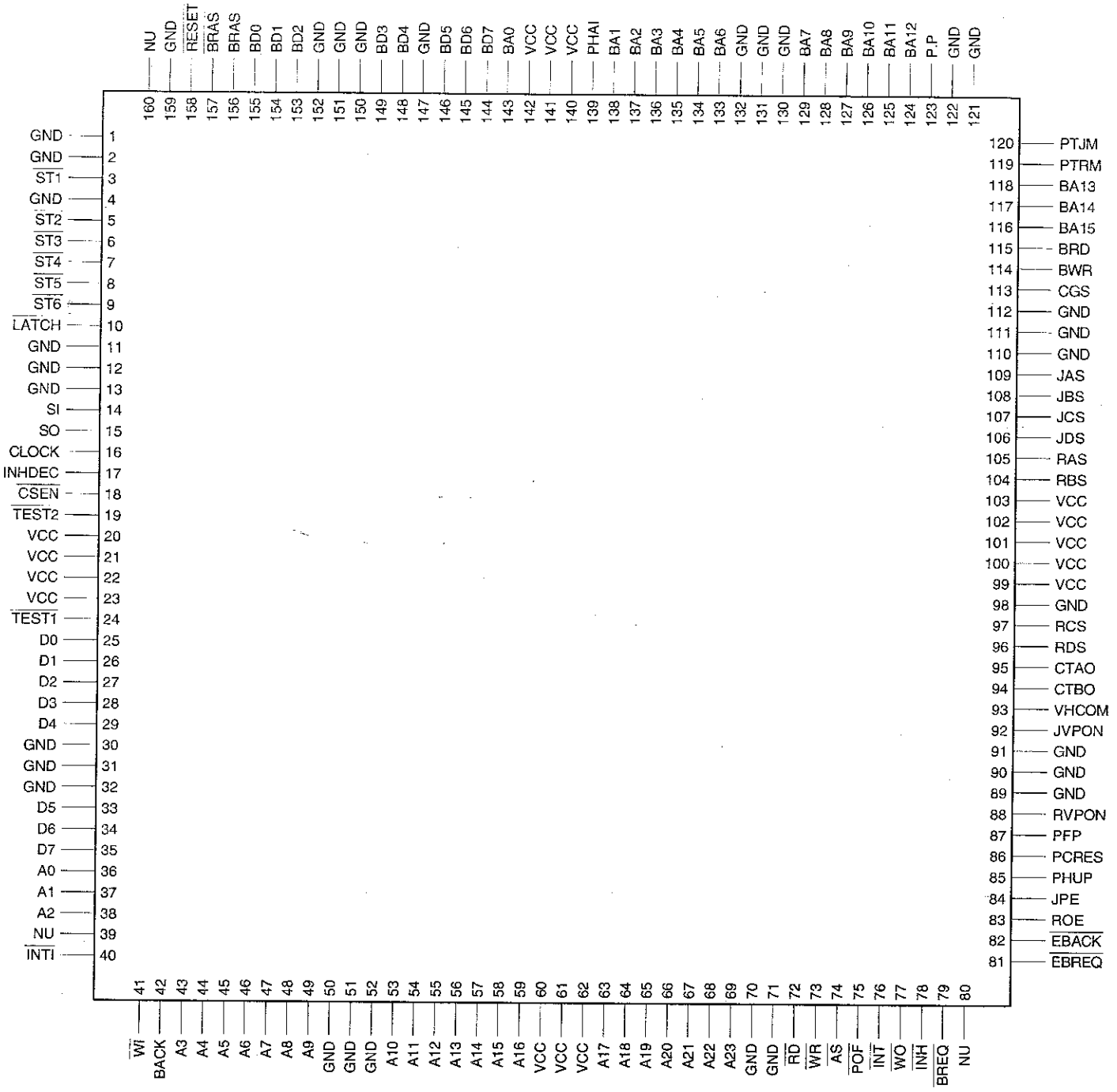
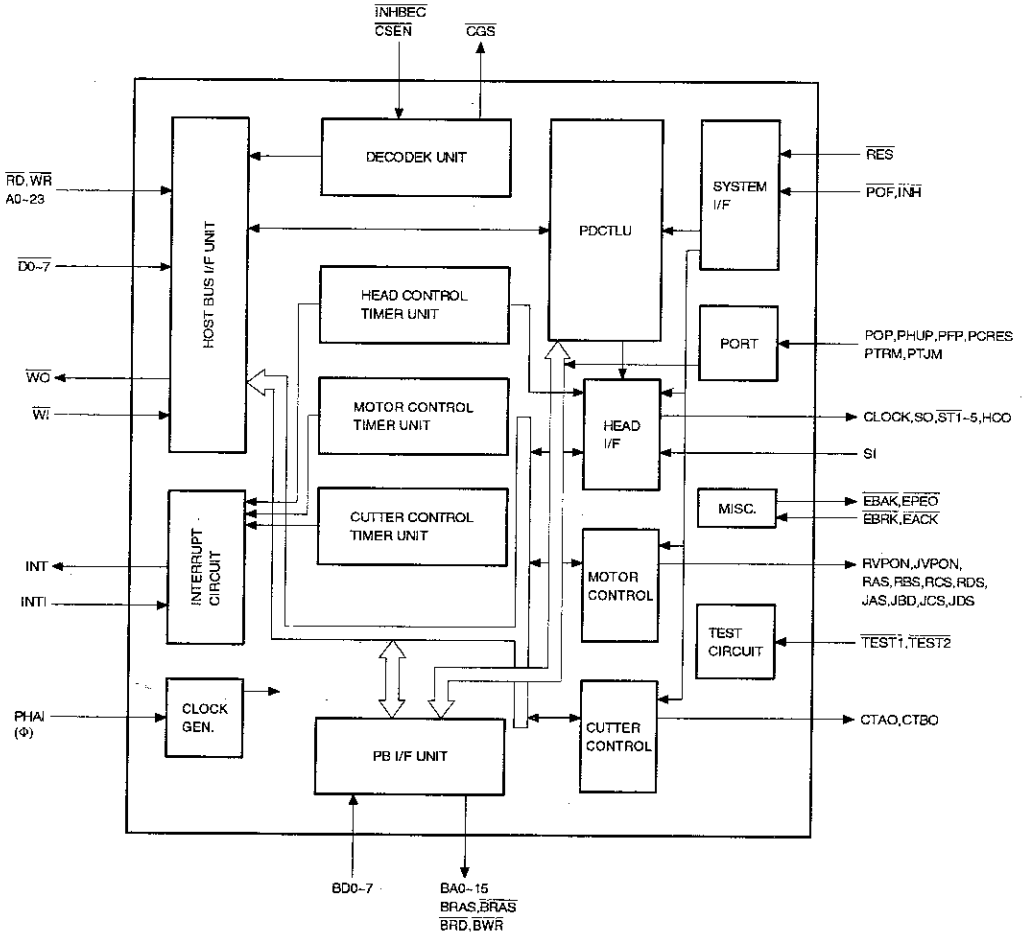


Fig. 2-7

3) Block diagram



TPRC1 BLOCK DIAGRAM

Fig. 2-8

3) Pin description

Pin No.	Signal name	In/Out	Function
1	GND	—	GND
2	GND	—	GND
3	ST1	O	Head drive strobe signal 1
4	GND	—	GND
5	ST2	O	Head drive strobe signal 2
6	ST3	O	Head drive strobe signal 3
7	ST4	O	Head drive strobe signal 4
8	ST5	O	Head drive strobe signal 5
9	ST6	O	NU
10	LATCH	O	Head latch signal
11	GND	—	GND
12	GND	—	GND
13	GND	—	GND
14	SI	I	Data return line, thermalhead -- TPRC1
15	SO	O	Send data from TPRC1 to thermalhead Data from PB-RAM or zero data are outputted at the falling of CLOCK signal. 16

Pin No.	Signal name	In/Out	Function
16	CLOCK	O	Thermalhead CLOCK signal SO is outputted at the edge of l Ä O, and is taken at the edge of o Ä l.
17	INHDEC	I	GND
18	CSEN	I	GND
19	TEST2	I	+5V internal counter timer test pin
20	Vcc	—	+5V
21	Vcc	—	+5V
22	Vcc	—	+5V
23	Vcc	—	+5V
24	TEST1	I	+5V internal counter timer test pin
25	D0	I/O	Data bus 0: Internal register, print buffer data IO
26	D1	I/O	Data bus 1: Internal register, print buffer data IO
27	D2	I/O	Data bus 2: Internal register, print buffer data IO
28	D3	I/O	DAta bus 3: Internal register, print buffer data IO

Pin No.	Signal name	In/Out	Function
29	D4	I/O	Data bus 4: Internal register, print buffer data IO
30	GND	—	GND
31	GND	—	GND
32	GND	—	GND
33	D5	I/O	Data bus 5: Internal register, print buffer data IO
34	D6	I/O	Data bus 6: Internal register, print buffer data IO
35	D7	I/O	Data bus 7: Internal register, print buffer data IO
36	A0	I	Address bus 0
37	A1	I	Address bus 1
38	A2	I	Address bus 2
39	NU	—	NU
40	$\overline{INTI}$	I	+5V
41	$\overline{WI}$	I	+5V
42	$\overline{BACK}$	I	$\overline{BACK}$
43	A3	I	Address bus 3
44	A4	I	Address bus 4
45	A5	I	Address bus 5
46	A6	I	Address bus 6
47	A7	I	Address bus 7
48	A8	I	Address bus 8
49	A9	I	Address bus 9
50	GND	—	GND
51	GND	—	GND
52	GND	—	GND
53	A10	I	Address bus 10
54	A11	I	Address bus 11
55	A12	I	Address bus 12
56	A13	I	Address bus 13
57	A14	I	Address bus 14
58	A15	I	Address bus 15
59	A16	I	Address bus 16
60	Vcc	—	+5V
61	Vcc	—	+5V
62	Vcc	—	+5V
63	A17	I	Address bus 17
64	A18	I	Address bus 18
65	A19	I	Address bus 19
66	A20	I	Address bus 20
67	A21	I	Address bus 21
68	A22	I	Address bus 22
69	A23	I	Address bus 23
70	GND	—	GND
71	GND	—	GND
72	$\overline{RD}$	I	Read strobe signal: Gate enable of data bus D0 - D7 tri-state buffer
73	$\overline{WR}$	I	Write strobe signal: Write enable into the internal register and the print buffer.
74	$\overline{AS}$	I	$\overline{AS}$
75	$\overline{POF}$	I	Power off signal

Pin No.	Signal name	In/Out	Function
76	$\overline{INT}$	O	Interrupt signal
77	$\overline{WO}$	O	Wait request signal to the CPU
78	$\overline{INH}$	I	Head drive inhibit
79	$\overline{BREQ}$	O	Bus request to CPU
80	—	—	NU
81	$\overline{EBREQ}$	I	Bus request from option
82	$\overline{EBACK}$	O	Bus acknolege to option
83	RPE	I	Receipt paper empty
84	JPE	I	Journal paper empty
85	PHUP	I	Printer head up
86	PCRES	I	Auto cutter unit reset signal input
87	PFP	I	Auto cutter unit FP signal input
88	RVPON	O	Receipt side paper feed pulse motor common power control signal
89	GND	—	GND
90	GND	—	GND
91	GND	—	GND
92	JVPON	O	Journal side paper feed pulse motor common power control signal (Not use)
93	VHCOM	O	Head drive common power control
94	CTBO	O	Cutter motor control signal
95	CTAO	O	Cutter motor control signal
96	RDS	O	Receipt side paper feed pulse motor drive signal, phase D
97	RCS	O	Receipt side paper feed pulse motor drive signal, phase C
98	GND	—	GND
99	Vcc	—	+5V
100	Vcc	—	+5V
101	Vcc	—	+5V
102	Vcc	—	+5V
103	Vcc	—	+5V
104	RBS	O	Receipt side paper feed pulse motor drive signal, phase B
105	RAS	O	Receipt side paper feed pulse motor drive signal, phase A
106	JDS	O	Journal side paper feed pulse motor drive signal, phase D
107	JCS	O	Journal side paper feed pulse motor drive signal, phase C
108	JBS	O	Journal side paper feed pulse motor drive signal, phase B
109	JAS	O	Journal side paper feed pulse motor drive signal, phase A
110	GND	—	GND
111	GND	—	GND
112	GND	—	GND
113	CGS	O	NU
114	$\overline{BWR}$	O	PB-RAM write strobe signal
115	$\overline{BRD}$	O	PB-RAM read strobe signal
116	BA15	O	NU
117	BA14	O	Address 14 for PB-RAM
118	BA13	O	Address 13 for PB-RAM
119	PTRM	I	NU

Pin No.	Signal name	In/Out	Function
120	PTJM	I	NU
121	GND	—	GND
122	GND	—	GND
123	POPI	O	GND
124	BA12	O	Address bus 12 for PB-RAM
125	BA11	O	Address bus 11 for PB-RAM
126	BA10	O	Address bus 10 for PB-RAM
127	BA9	O	Address bus 9 for PB-RAM
128	BA8	O	Address bus 8 for PB-RAM
129	BA7	O	Address bus 7 for PB-RAM
130	GND	—	GND
131	GND	—	GND
132	GND	—	GND
133	BA6	O	Address bus 6 for PB-RAM
134	BA5	O	Address bus 5 for PB-RAM
135	BA4	O	Address bus 4 for PB-RAM
136	BA3	O	Address bus 3 for PB-RAM
137	BA2	O	Address bus 2 for PB-RAM
138	BA1	O	Address bus 1 for PB-RAM
139	PHAI	I	TPRC1 clock input pin
140	Vcc	—	+5V
141	Vcc	—	+5V
142	Vcc	—	+5V
143	BA0	O	Address bus 0 for PB-RAM
144	BD7	I/O	Data bus 7 for PB-RAM
145	BD6	I/O	Data bus 6 for PB-RAM
146	BD5	I/O	Data bus 5 for PB-RAM
147	GND	—	GND
148	BD4	I/O	Data bus 4 for PB-RAM
149	BD3	I/O	Data bus 3 for PB-RAM
150	GND	—	GND
151	GND	—	GND
152	GND	—	GND
153	BD2	I/O	Data bus 2 for PB-RAM
154	BD1	I/O	Data bus 1 for PB-RAM
155	BD0	I/O	Data bus 0 for PB-RAM
156	BRAS	O	PB-RAM chip select: Active HIGH
157	$\overline{\text{BRAS}}$	O	PB-RAM chip select: Active LOW
158	$\overline{\text{RESET}}$	I	TPRC1 reset signal
159	GND	—	GND
160	NU	—	GND

3. Clock generator

1) CPU (HD6415108FX)

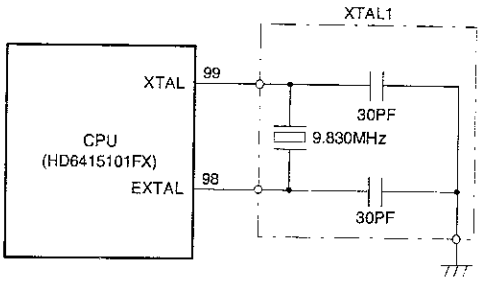


Fig. 3-1

Basic clock is supplied from a 9.830MHz ceramic oscillator.
The CPU contains an oscillation circuit from which the basic clock is internally driven. If the CPU was not operating properly, the signal does not appear on this line in most cases.

2) HD404728A20FS CKDC-III oscillation circuit (Display-PWB)

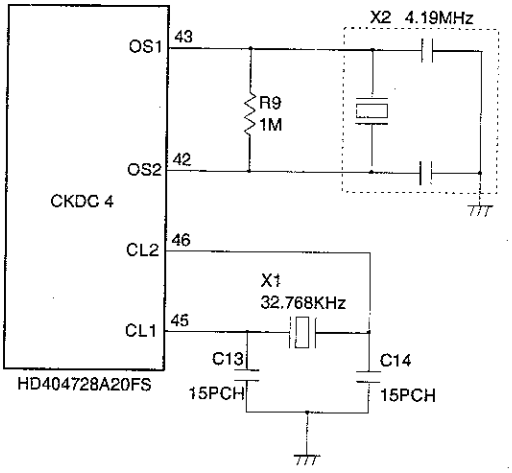


Fig. 3-2

Two oscillators are connected to the CKDC4.
The main clock X2 generates 4.19MHz which is used during power on.
When power is turned off, the CKDC4 goes into the standby mode and the main clock stops.
The sub-clock X1 generates 32.768KHz which is primarily used to update the internal RTC (real time clock). During the standby mode, it keeps oscillating to update the clock and monitoring the power recovery.

4. Reset (POFF) circuit

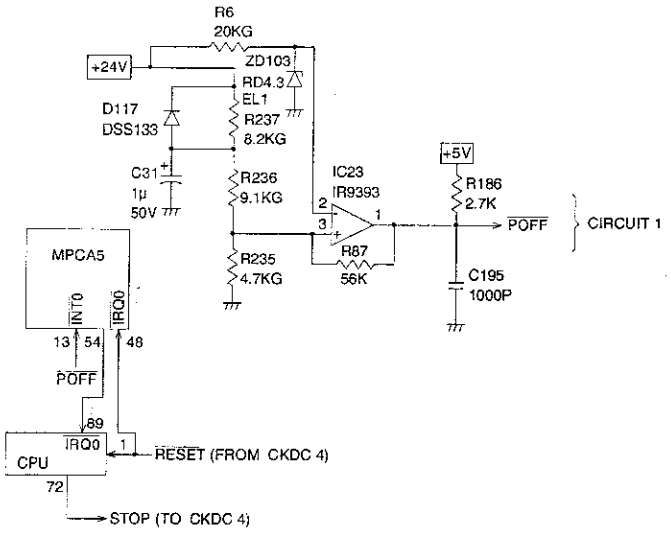


Fig. 4-1

In order to prevent memory loss at a time of power off and power supply failure of the ECR, the power supply condition is monitored at all times. When a power failure is met, the CPU suspends the execution of the current program and immediately executes the power-off program to save the data in the CPU registers in the external S-RAM with the signal $\overline{\text{STOP}}$ forced low to prepare for the power-off situation. The signal $\overline{\text{STOP}}$ is supplied to the CKDC4 as signal $\overline{\text{RESET}}$ to reset the devices.

This circuit monitors +24V supply voltage.

The voltage at the (–) pin of the comparator IR9393 is always maintained to 4.3V by means of the zener diode ZD103, while +24V supply voltage is divided through the resistors R237, R236, and R235, and is applied to the (+) pin. When normal +24V is in supply, 5.1V is supplied to the (+) pin, therefore, signal $\overline{\text{POFF}}$ is at a high level. When +24V supply voltage decreases due to a power off or any other reason, the voltage at the (+) pin also decreases. When +24V supply voltage drops, the voltage at the (+) pin drops below +4.3V, which causes $\overline{\text{POFF}}$ to go low, thus predicting the power-off situation.

5. Memory control

1) Memory map

① All range memory map

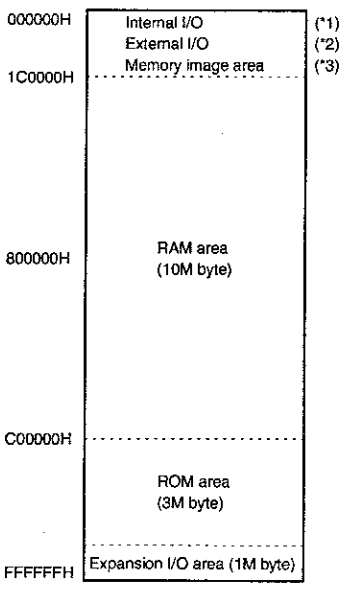


Fig. 5-1

(*1) "Internal I/O" means the registers in the H8/510.

(*2) "External I/O" means the base system I/O area to be addressed in page 0.

(*3) "Memory image area" means the lower 32KB of ROM area which is projected to 000000H ~ 007FFFH for allowing reset start and other vector addressing, or the lower 32KB of ROM area which is projected to 008000H ~ 00FE7FH for allowing 0 page addressing of work RAM area.

(*4) "Expansion I/O" means expansion I/O device area which isaddressed to area other than page 0.

② 0 page memory map

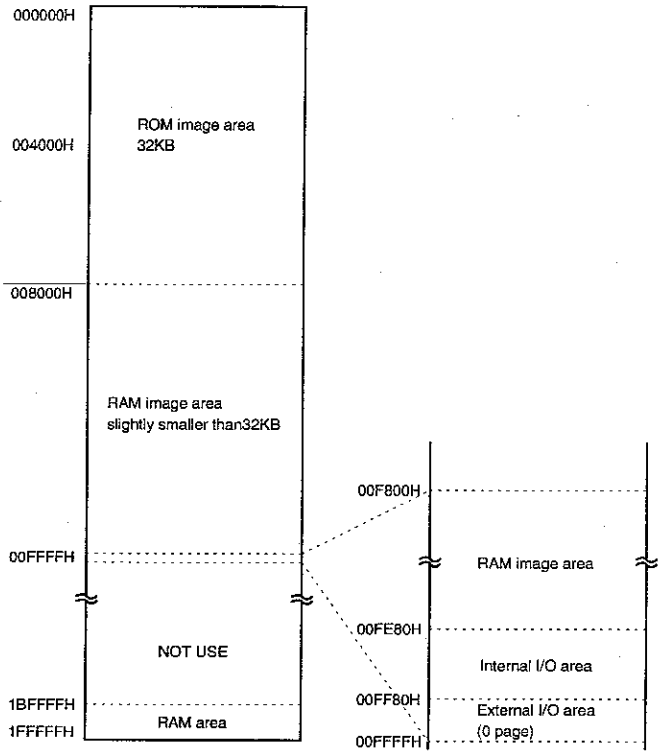


Fig. 5-2

- ROM image area: Image is formed in ROM area address C00000H C07FFFH. This area is identical to IPL ROM area which will beseparately developed.
- RAM image area: Image is formed in RAM area address 1D8000H1DFE7FH. (*Note)

  * Note: Image can be formed in lower 32KB of RAS2.

③ **ROM area memory map**

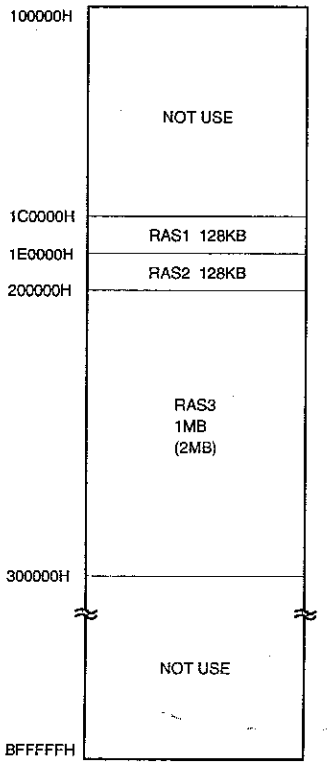


Fig. 5-3

These two decode signals decode 512KB space respectively and canbe used with max. 4MB ROM.

* Note: The lower 32KB of ROS1 signal is formed as OR of image area in 0page.

④ **RAM area memory map**

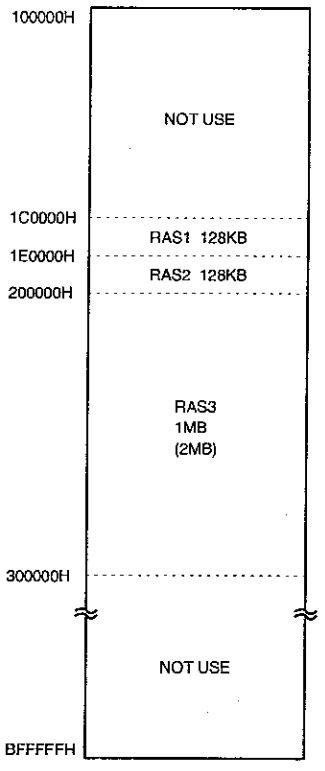


Fig. 5-4

In the three RAM chip select, the following address is decoded.

CS signal	Address
• RAS1	1C0000H~1DFFFFH (008000H~00FE7FH) * Note
• RAS2	1E0000H~1FFFFFH (008000H~00FE7FH) * Note
• RAS3	200000H~3FFFFFH

* Base signal is for 2M.

* Note: RAS1 signal is formed as OR in the image area of 0 page.j (Lower 32KB).
RAS2 signal is formed as OR in the image area of 0 page. (lower32KB).

⑤ **I/O area memory map**

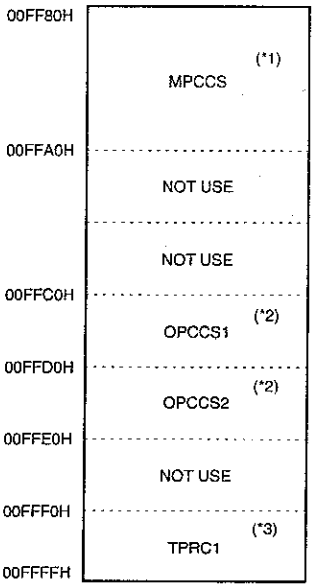


Fig. 5-5

* Note 1: MPCCS signal is the base signal for MPCA5 internal registerdecoding, and does not exist as an internal signal.

* Note 2: OPCCS1 and OPCCS2 signals are decoded in the OPC (optionperipheral controller) using the base signal OPTCS for optiondecoding. They does not exist as external signals.

* Note 3: TPRC1 signal is the base signal for TPRC1 internal register decoding, and does not exist asan internal signal.

2) Block diagram

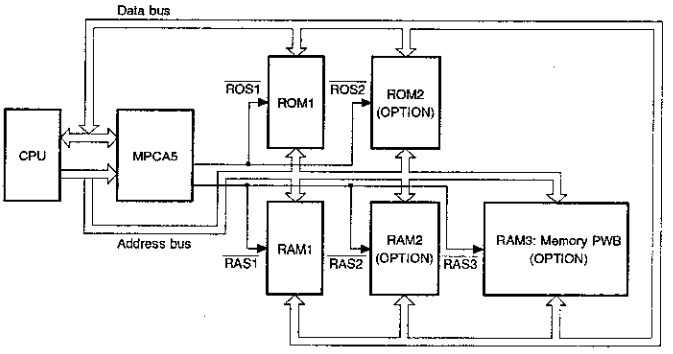


Fig. 5-6

① **ROM control**

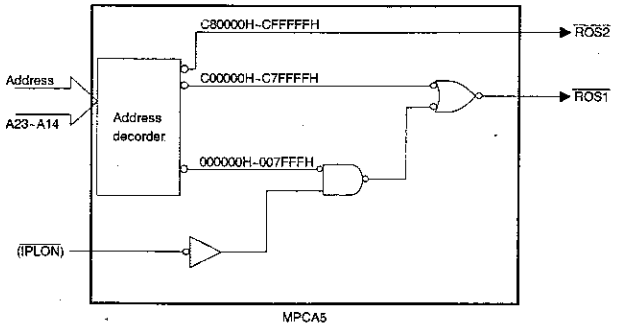


Fig. 5-7

IPLON: IPL board detection signal incorporated in the option slot. Note used in the ER-A670. (Not used)

Access is performed with two ROM chip select signals ROS1 and ROS2, which decode 512KB address area respectively to accessmax. 4MB ROM.

② **RAM control**

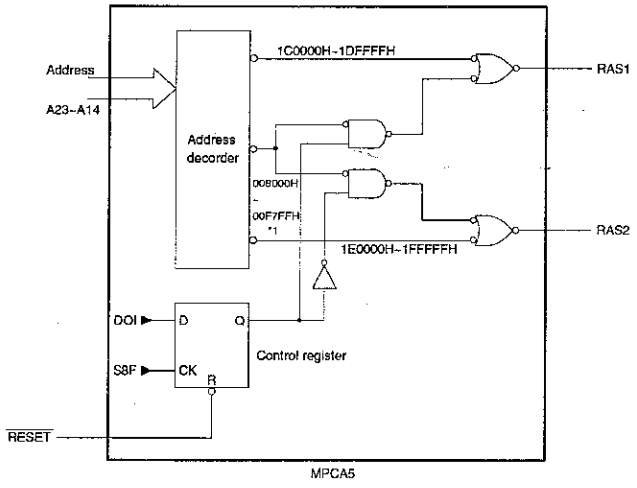


Fig. 5-8

Access is performed with two RAM chip select signals RAS1, RAS2 and RAS3. The control register in MPCA5 allows selection of pageimage memory area. (RAS1 is selected for initializing.)

∗ : For 0 page image area, selection between RAS1 and RAS2 can bemade with the control register. The 0 page control registerperforms initializing at the timing of no stack processimmediately after resetting.

6. SSP circuit

1) Block diagram

This is the circuit employed to do the Special Service Preset(SSP).

(Block diagram)

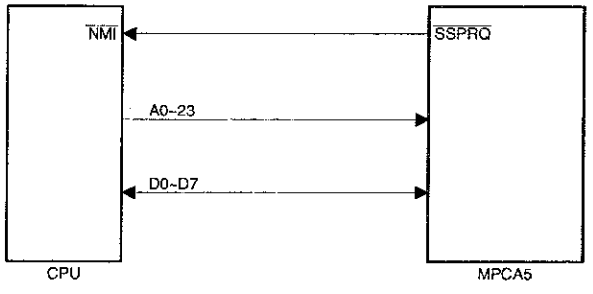


Fig. 6-1

(MPCA5 block diagram)

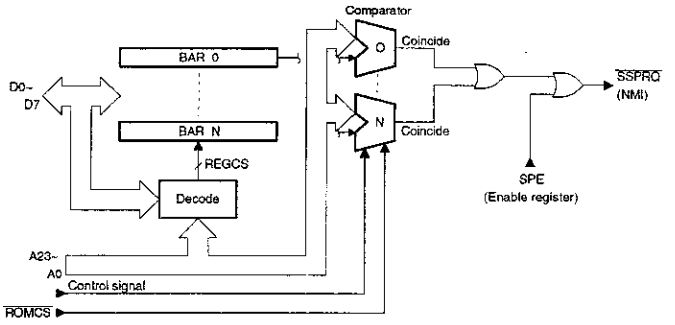


Fig. 6-2

As the address detection system, the brake address register comparison system is employed though the mapping system was employed in the conventional monitor RAM. The address registerlocated in MPCA is always compared with the system address bus to monitor and generate NMI signal at a synchronized timing and togo to NMI exception process.

In the exception process routine service routine, the entry address is checked to go to SSP sub routine.

Entry to the break address register (BAR) is performed through address FFFF00H or later decoded in MPCA5.

2) SSP register

The break address register (BAR) is accessed through direct address of FFFF00H~FFFFFFH. Entry number is 32 entry.

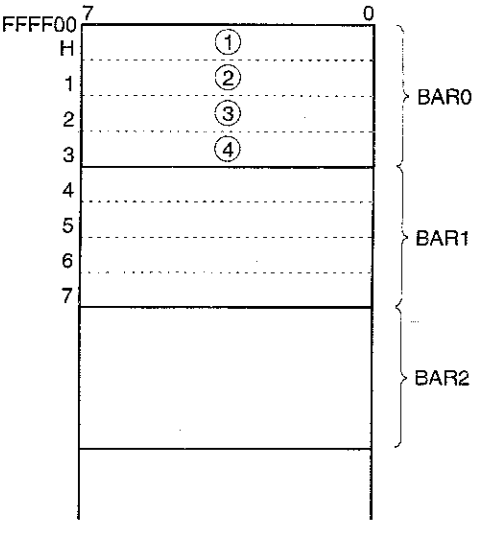
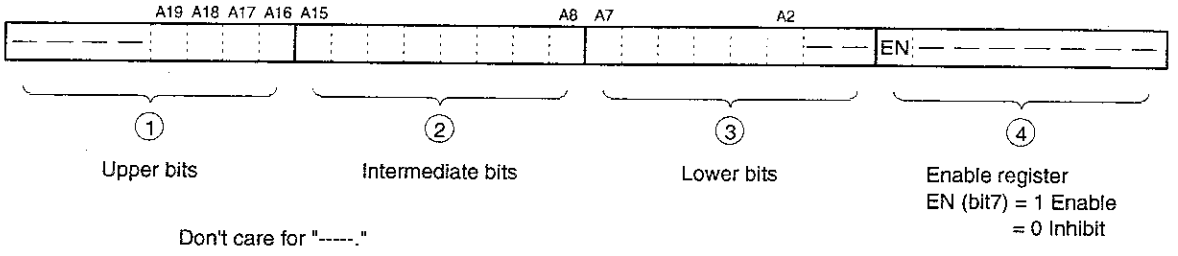


Fig. 6-3

Each BAR is composed of 4 byte address. Bit composition is as follows:



< BAR composition >

Fig. 6-4

④ is the enable register. The entry registers of the break address are assigned to ①, ②, and ③. Each bit of address corresponds to each bit position, writing to ①, ②, and ③ is performed without shifting. The corresponding area is 1MB space of ROS1 and ROS2.

3) SSP register access method

Access to SSP break address register is performed through the temporary register as shown below:

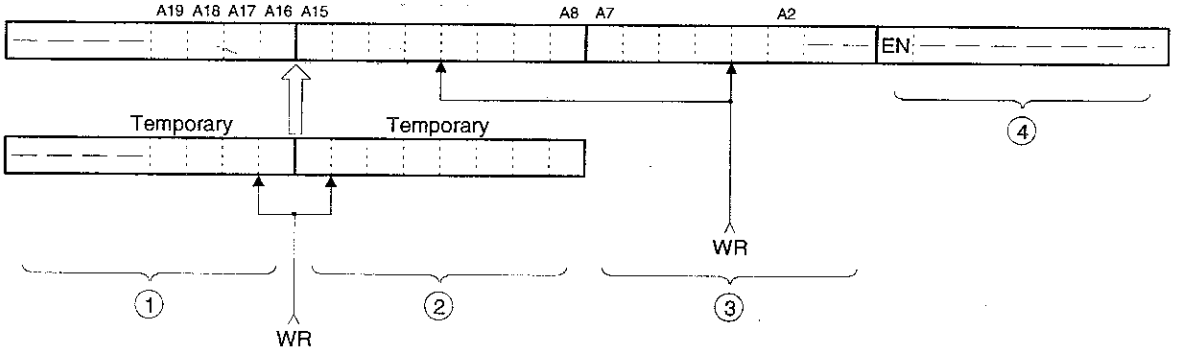


Fig. 6-5

Enable flags can be accessed individually.
Though enable register ④ can be accessed individually, writing to brake address registers ① and ② is performed at the same time as writing to brake address register ③ through the temporary register.
Therefore, set ① and ② to temporary, then write into ③ at last.
Since the temporary register is commonly used by BAR sets, thefollowing register setting is performed after completion ofsetting of each break address register.

③ SSP control method

Access to the enable register and the brake address register is only possible when writing to them from the CPU.

bit 7	6	5	4	3	2	1	0	
0	0	0	CMP4	CMP3	CMP2	CMP1	CMP0	(FFFFFFH)

Information on which brake register the SSP brake is detected in is read as binary data by reading address FFFFFFH (*1).
Used in an expanded register.
Normally is a reserve bit. Whenreading, fixed to 0.

If there are 32 break registers, binary expression is made with the above 5 bits, and 0th is "00000_R" and 31st is "11111_R."

When detected simultaneously by two or more break registers, onewith the smaller BAR number is read as binary data.

The brake signals (NMI) and the above detection data (CMP0~4) areheld until the above detection data are read. So read should bemade in the NMI sub routine. (Clear by FFFFFFH read.)

* 1: FFFFFFH is not fulldecoded. (FFFF00H~FFFFFFH). Therefore,unnecessary read access in parentheses should not be performed.

7. Printer control circuit

1) Block diagram

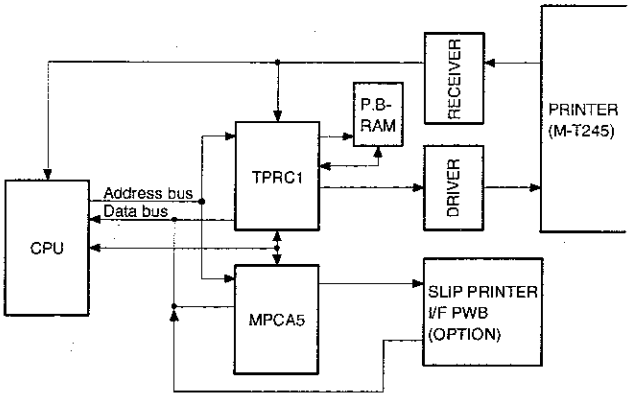


Fig. 7-1

- The thermal printer (M-T245) is controlled by the thermal printer controller (TPRC1). The PB-RAM connected to TPRC1 serves as a print data buffer.
- The slip printer is controlled by MPCA5 through the slip printer I/F (option).

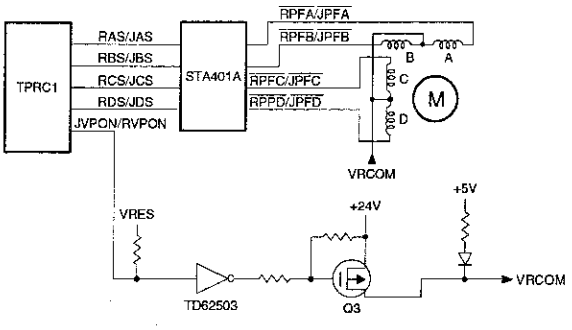


Fig. 7-2

2) Paper feed circuit

- A pulse motor is used as the paper feed motor.
- Drive sequence of the pulse motor is as follows:

Receipt feed motor: The motor rotates clockwise.

Step No.	Phase			
	A	B	C	D
1	ON	OFF	ON	OFF
2	ON	OFF	OFF	ON
3	OFF	ON	OFF	ON
4	OFF	ON	ON	OFF

Journal feed motor: The motor rotates counterclockwise.

Step No.	Phase			
	A	B	C	D
1	ON	OFF	OFF	ON
2	ON	OFF	ON	OFF
3	OFF	ON	ON	OFF
4	OFF	ON	OFF	ON

Note 1: ON = Conducting
OFF = Not conducting

Note 2: Step No. is performed by the internal process of TPRC1.

- When the motor is locked, the circuit is connected to the CPU through MPCA5.

3) Print circuit

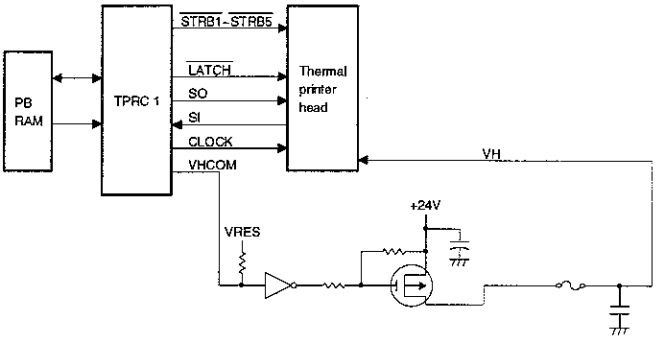


Fig. 7-3

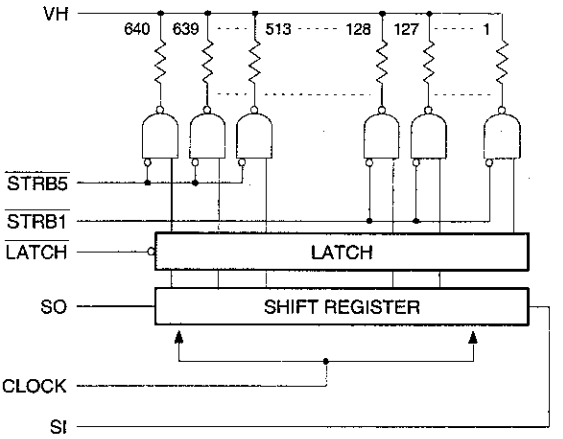
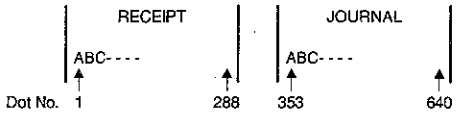


Fig. 7-4

TPRC1 outputs the data read from the PB-RAM as serial print data (SO).
Serial print data (SO) are transferred in synchronization with CLOCK to the shift register, and the print data are stored in the $\overline{\text{LATCH}}$ at the timing of LATCH signal.
The stored print data turn on the gate with strobe signals ($\overline{\text{STRB1}}$ ~ $\overline{\text{STRB5}}$) to conduct the heating element. The conduction pulse width is determined by the detected thermistor temperature of the thermal-head and the head supply voltage (VH).



* Dot No.289~352: No print area

Dot No.	1~128	129~256	257~384	385~512	513~640
Strobe No.	1	2	3	4	5
Dot/Strobe	128	128	128	128	128

STROBE signals are divided into two groups depending on the print work.

For R/J print: Divided into (1) $\overline{\text{STRB1}}$, $\overline{\text{STRB2}}$, and $\overline{\text{STRB3}}$, and (2) $\overline{\text{STRB4}}$ and $\overline{\text{STRB5}}$.

For Logo print: Divided into (1) $\overline{\text{STRB1}}$, and (2) $\overline{\text{STRB2}}$ and $\overline{\text{STRB3}}$.

4) Cutter circuit

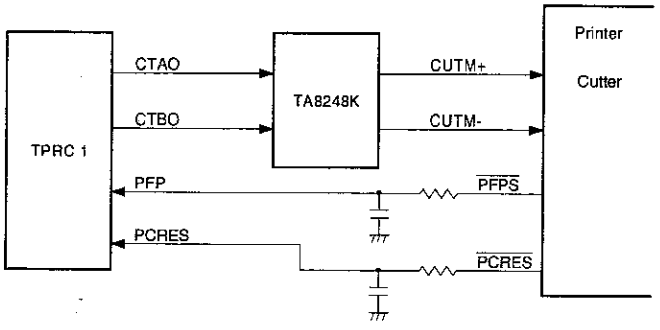


Fig. 7-5

- The cutter motor is conducted by CTAO signal from TPRC1 to drive the cutter blade. After setting paper, the reset signal (PCRES) and the full-cut/partial-cut position signal are returned to TPRC1, and the cutter motor is rotated reversely by CTBO signal from TPRC1 to return the cutter blade to its home position.

8. Drawer drive circuit

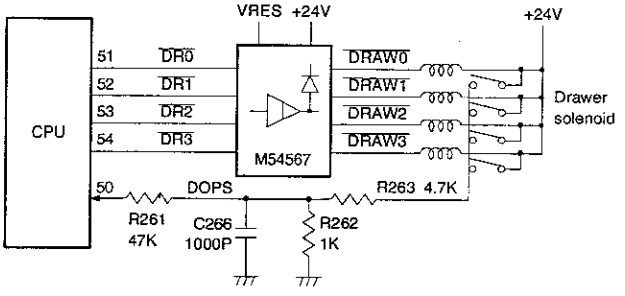
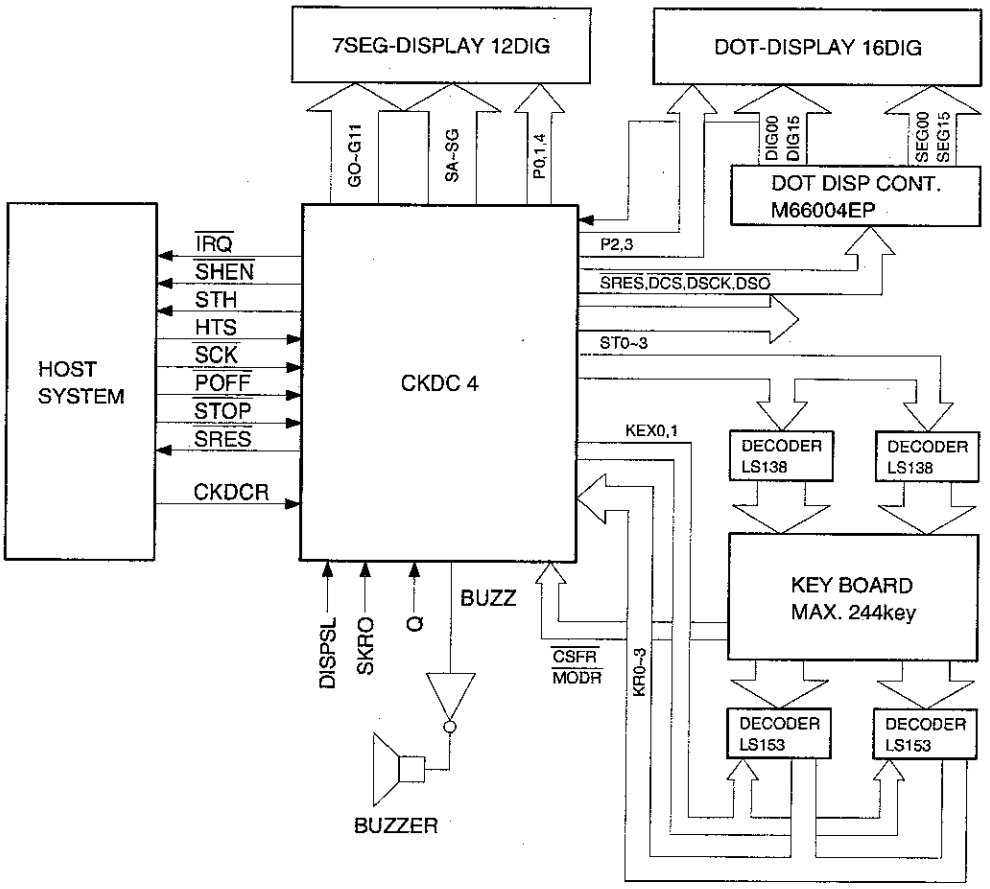


Fig. 8-1

The drawer is directly supported by the CPU. No action starts when the power supply is not steady as the output stage of the driver is pulled VP by VRES signal.
Drawer open and close is sensed with the microswitch provided in the drawer whose signal is level converted with R262 and R263 and directly read by the CPU.

9. Key, display, timer, buzzer controls

The keys, switches, displays, timer/calendar, and buzzer are controlled by the CKDC-4 on the display PWB.



Block diagram
Fig. 9-1

1) Power on/off sequence

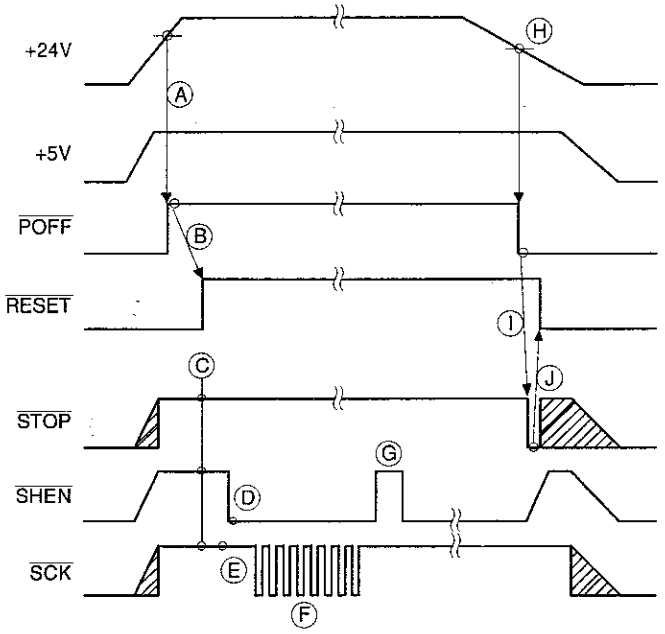


Fig. 9-2

Hatched area indicates logic unstable.

<At power on>

When +24V power rises, the signal $\overline{POFF}$ is forced high (A), by which time the +5V supply becomes stable. The CKDC-III monitors the state of $\overline{POFF}$ while updating the timer/calendar in the low power standby mode, and when the high state of $\overline{POFF}$ is detected, the system reset signal ($\overline{RESET}$) is set high (B), by which time the output lines $\overline{STOP}$ and $\overline{SCK}$ of the CPU and MPCA5 have been initialized to high, respectively (C). Thereafter, the CKDC-III sets $\overline{SHEN}$ active (low) (D) to notify the CPU of the command/data communication ready state.
One byte data/command can be transferred with eight $\overline{SCK}$ pulses (F). When one byte has been transferred with eight $\overline{SCK}$ pulses, the CKDC-III sets $\overline{SHEN}$ high to initiate internal processing. After completion of the internal processing, when the next byte transfer becomes ready, the CKDC-III sets $\overline{SHEN}$ back to a low state to wait for the next byte transfer (G).
Thereafter, the $\overline{SHEN}$ and $\overline{SCK}$ timing described above is repeated to carry on the communication.

<At power off>

When +24V power drops, $\overline{POFF}$ goes low (H).
A low on the $\overline{POFF}$ line causes a low level interrupt request which is sent the $\overline{IRQ0}$ pin of the CPU. Within a maximum of 10msec of the low level $\overline{IRQ0}$ input, the CPU performs software processing necessary for power-off, after which the $\overline{STOP}$ output is set low (I).
When $\overline{STOP}$ goes low, the CKDC-III sets $\overline{RESET}$ low to reset the whole system (J). And, the +5V supply is held at 4.75V or higher voltage, after which the voltage drops to a level that the logic circuit does not operate.

2) Key and switch scanning

Strobes ST0 ~ ST3 are decoded on the keyboard by two 74LS138 3-to-8 decoders to generate 16 strobe signals of $\overline{S15}$ ~ $\overline{S0}$.
The key matrix consists of 16 strobe lines and 16 returns lines of $\overline{KR0A}$, $\overline{KR1A}$, $\overline{KR2A}$, $\overline{KR3A}$, $\overline{KR0B}$, $\overline{KR1B}$, $\overline{KR2B}$, and $\overline{KR3B}$.
To minimize interfacing lines between the CKDCIII and the keyboard unit, two multiplexers (74HC153) are used to multiplex signals by the timing controlled with the signals KEX0 and KEX1 which are sent to the CKDCIII on the return lines of $\overline{KR0}$ ~ $\overline{KR3}$.

Timing ST

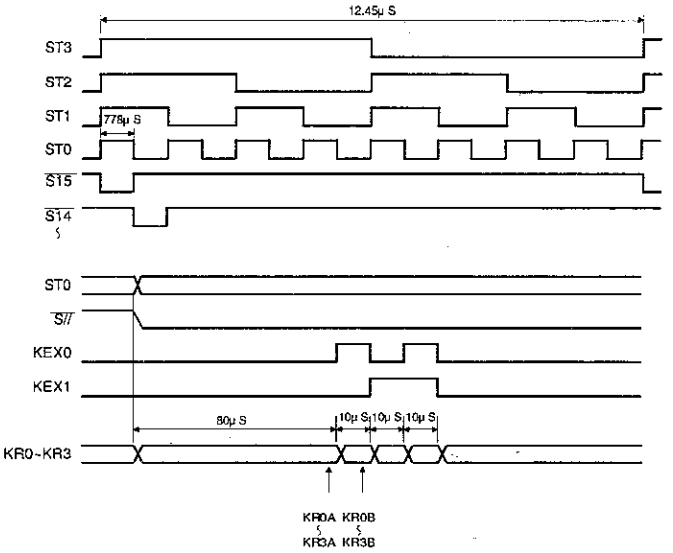


Fig. 9-3

The mode switch in provided with a special return line $\overline{MODR}$, apart from the above return lines.
In the same manner, the clerk, paper feed key (J/R), and receipt on/off switches use $\overline{CFSR}$ as the return line.

3) DISPLAY CONTROL

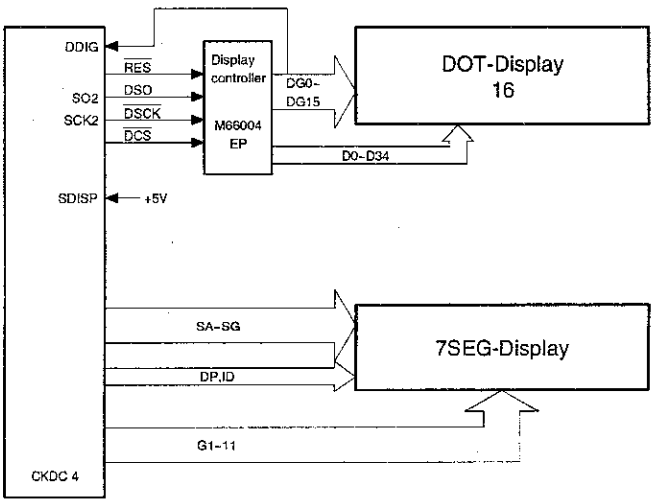


Fig. 9-4

CKDC4 directly drives the 7-segment display unit and the dot display is driven via M66004FP.

<7-segment display>

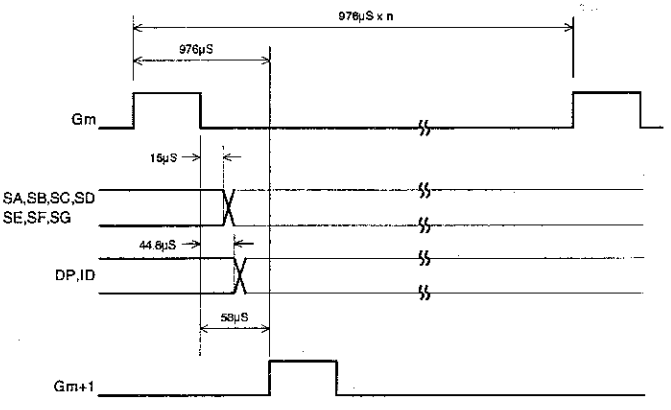


Fig. 9-5

<Dot display>

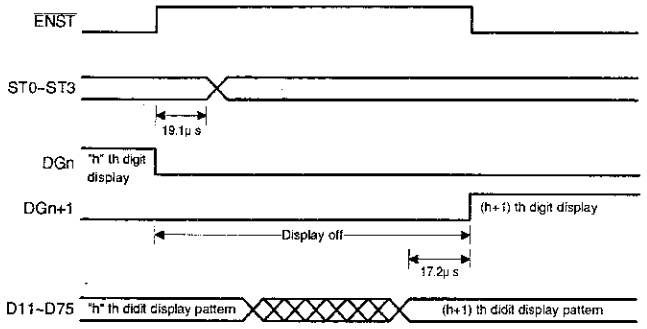


Fig. 9-6

IMPORTANT:

The CKDCIII lines are not high voltage resistive ports. Damage may occur to the CKDC4 if lines are ahorted carelessly when using oscillo-scope probes.

- Dot matrix tube
  A 4-bit binary output signals (ST0-ST3) from CDKC4 are converted into the digit drive signal (DG0-DG15) in the M66004FP.

<Dot display control>

The CKDC4 controls the character segment (5 x 7) and the indicator of the dot display by using the controller (M66004FP) for dot display control.

① M66004PF/Dot display control signal

Signal name	Contents	Pin/Remark
DSO	Serial data output signal for M66004FP	C-MOS pin
$\overline{DSCK}$	Serial shift clock output signal for M66004FP	C-MOS pin. Requires to be pulled up
$\overline{DCS}$	Chip select output signal for M66004FP	C-MOS pin

D0	D1	D2	D3	D4
D5	D6	D7	D8	D9
D10	D11	D12	D13	D14
D15	D16	D17	D18	D19
D20	D21	D22	D23	D24
D25	D26	D27	D28	D29
D30	D31	D32	D33	D34

10. Power supply circuit

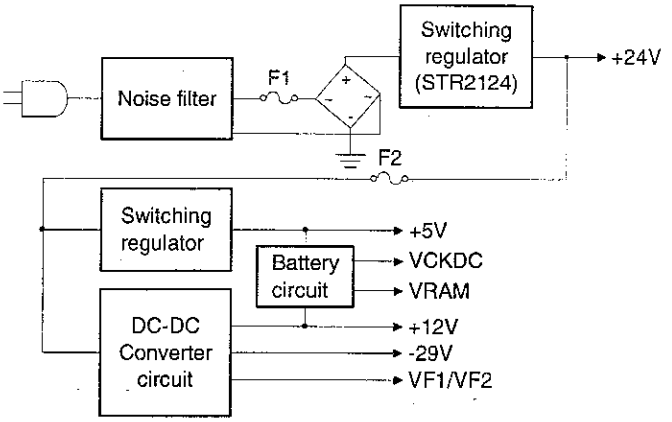


Fig. 10-1

+24V:	Printer, solenoid power
+5V:	VCC (Logic power)
+12V:	Battery charge, IN-LINE driver power
–29V:	Display tube power
VF1, VF2:	Display tube power (AC)
VRAM:	Battery back-uped power
VCKDC:	CKDC III Back-up power

For the DC-DC converter, refer to section 8 of cash register Basic manual.

11. Switching regulator circuit

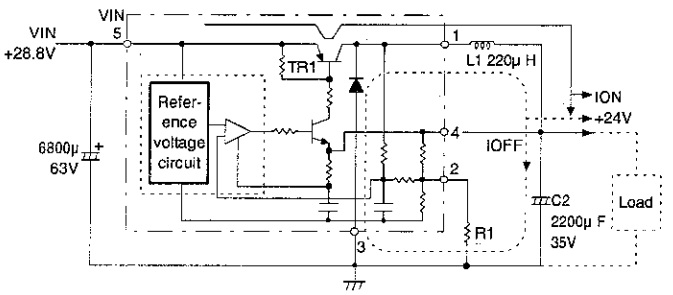


Fig. 11-1

By switching VIN (+28.8V) by the transistor TR1 within the STR2124, DC+24V supply is obtained through the LC network. Stable +24V is obtained by controlling on/off duty of TR1.

ION: Current when TR1 is on.
IOFF: Current when TR1 is off.

CHAPTER 5. TEST FUNCTION

1. General

1) This diagnostic program has been developed for diagnosing machine functions in the field. The program is contained with in the ER-A670.
The diagnostic program is stored in the external ROM which will be executed by the CPU (H8/510) which requires the following diagnostic operations:

a) Proper power supply voltages are mandatory for logic circuits (+5V, VRAM, VCKDC, POFF, 12V, +24V).

b) CPU input/output pins, CPU internal logic, CKDC5, MPCA5, TPRC, address decoder, address bus, data bus, and common ROM/RAM must be working properly.

2. Operational procedure

To start the diagnostic program, you must enter the following command.
3-digit test item number → [TL] key in the SRV mode.
The key assignment must be properly set and a part for ROM and RAM must be operating properly to go into this mode because the control jumps to the program area in the SRV mode. A master reset must be performed before operating the ECR for the first time. After any option is installed, a program reset is required. When the master reset or program reset is performed, be sure to check the printout on the journal paper.

Master reset:	Turn power on in the SRV' mode and change it to the SRV mode with the [JF] key pressed.
Journal print:	MASTER RESET ***
Program reset:	Turn power on in the SRV' mode and change it to the SRV mode.
Journal print:	PRG. RESET ***

3. Test command list

With the SRV mode and the following command entry, the test starts.

Code	Description
100	Display test-1
101	Key, clerk, and switch position code display
102	R/J printer test
103	Slip printer test
104	Keyboard test
105	Mode switch test
106	Validation sensor and near end sensor test
107	BOF, TOF and IFV test
108	Calendar oscillator test
109	SSP test
110	Drawer-1 open and sensor test
111	Drawer-2 open and sensor test
112	Drawer-3 open and sensor test
113	Drawer-4 open and sensor test
116	Display test-2
117	SIO test-1
120	Standard RAM test
130	Standard ROM test
151	A/D conversion test
200 ~ 206	Option RAM chip test
300 ~ 306	Option RAM address test
400	Option ROM test

[1] Display test-1

① Key operation
100 → [TL]

② Functional description
The following is displayed:

DOT DISPLAY : 0 1 2 3 4 5 6 7 8 9 ; A a B b C

7SEG DISPLAY : 0. 1. 2. 3. 4. 5. 6. 7. 8. 9. -.

POP-UP DISPLAY : 4. 5. 6. 7. 8. 9. -.

③ Check the following items:

a) Check for proper activation of display elements.

b) Check for blur, uneven illumination, and partial omission.

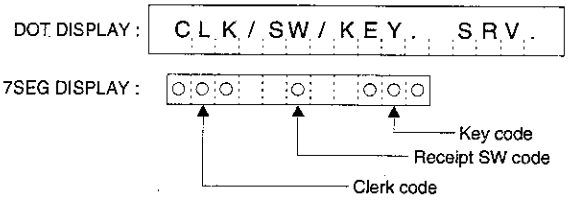
④ Test termination
Press any key. The test terminates with the test and message printed.

100
Test termination print

[2] Key, cashier, and switch position code display

① Key operation
101 → [TL]

② Functional description



Key, clerk, and receipt switch codes are displayed.

③ Check the following items:
Change key and switch positions for proper display activation.

Clerk code:	One hole clerk key or WMF key 000 (off state) 001 (Clerk 1) 002 (Clerk 2) ~ 255 (Clerk 255)
Receipt switch code:	0 (on state) 1 (off state)
Key code:	--- (simultaneous two key depression, invalid entry) 001 ~ 158

NOTE: Refer to JOB#104, key soft code, for the key code. (Fig. 3-2.)

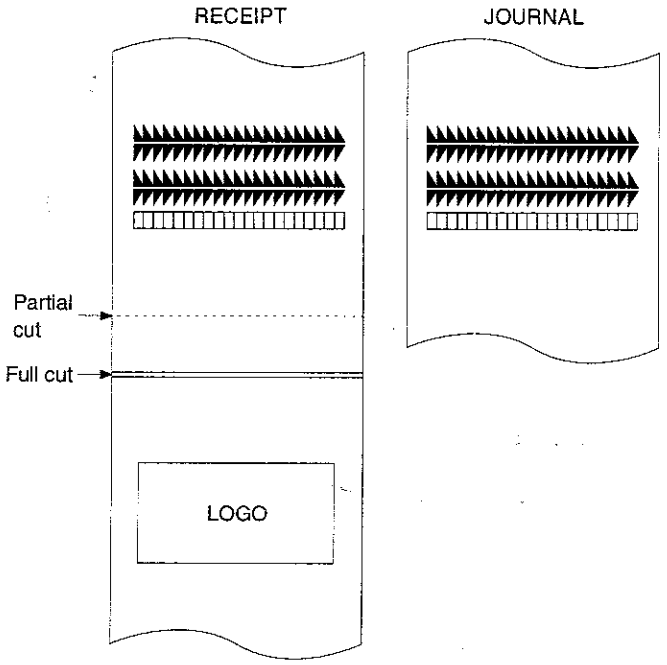
④ Test termination
Change the MODE switch position other than SRV position to terminate the test. The test termination message is printed.

101
Test termination print

[3] R/J printer test

① Key operation
102 → TL

② Content
Five lines of special characters are printed as follows on the receipt and the journal regardless of receipt (ON/OFF) switch setting.



③ Check content

1. Check that the slanted lines of special characters are clearly printed.
2. Check that the characters are printed at a uniform density.
3. Check the paper feed operation and the logo print.
4. Check partial cut and full cut.

④ Termination
This check is terminated automatically.
The termination print is not performed.

[4] Slip printer test

① Key operation
As slip must be set on the print table.
103 → TL

② Functional description
Regardless of paper setting, 35 digits of "Z" are printed on five lines, then the printer stops after releasing the paper.

③ Check the following items:
a) Print starting position must line up in the same column.
b) Check the print quality.
c) Make sure that the paper is released at the terminattion.

<Print sample>

ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ

④ Test termination
The test terminates automatically. If the paper release lever is not up, perform JOB#107 BTF, IFV test to release the paper.

If the ER-31SP (printer and I/F PWB unit) is not connected when performing this test, the following error display is made.
To cancel the error state, press any key or shift the mode key position, and the R/J printer will print the error print, terminating the operation.

Error display:

DOT DISPLAY : S L I P I / F E R R S R V .

Error print:

R/J printer:	E – – – – – 103

[5] Keyboard test

① Key operation
104 → TL

② Functional description
Key actions of the standard version ER-A670 are tested.
Press keys on the keyboard in the order given in the figure 3-1. If the test has been successful, the test terminates with the printout showing correct action of every key. If an error has occured in the course of a test, an error message will be printed immediately upon occurrence of the error. When the test is interrupted, the normal test termination printout is not produced.

③ Check the termination print

④ Test termination
When the last key (see next page) is depressed, the test terminates with the termination printout.

104	E – – ✱✱✱ 104
Test termination print	Error print

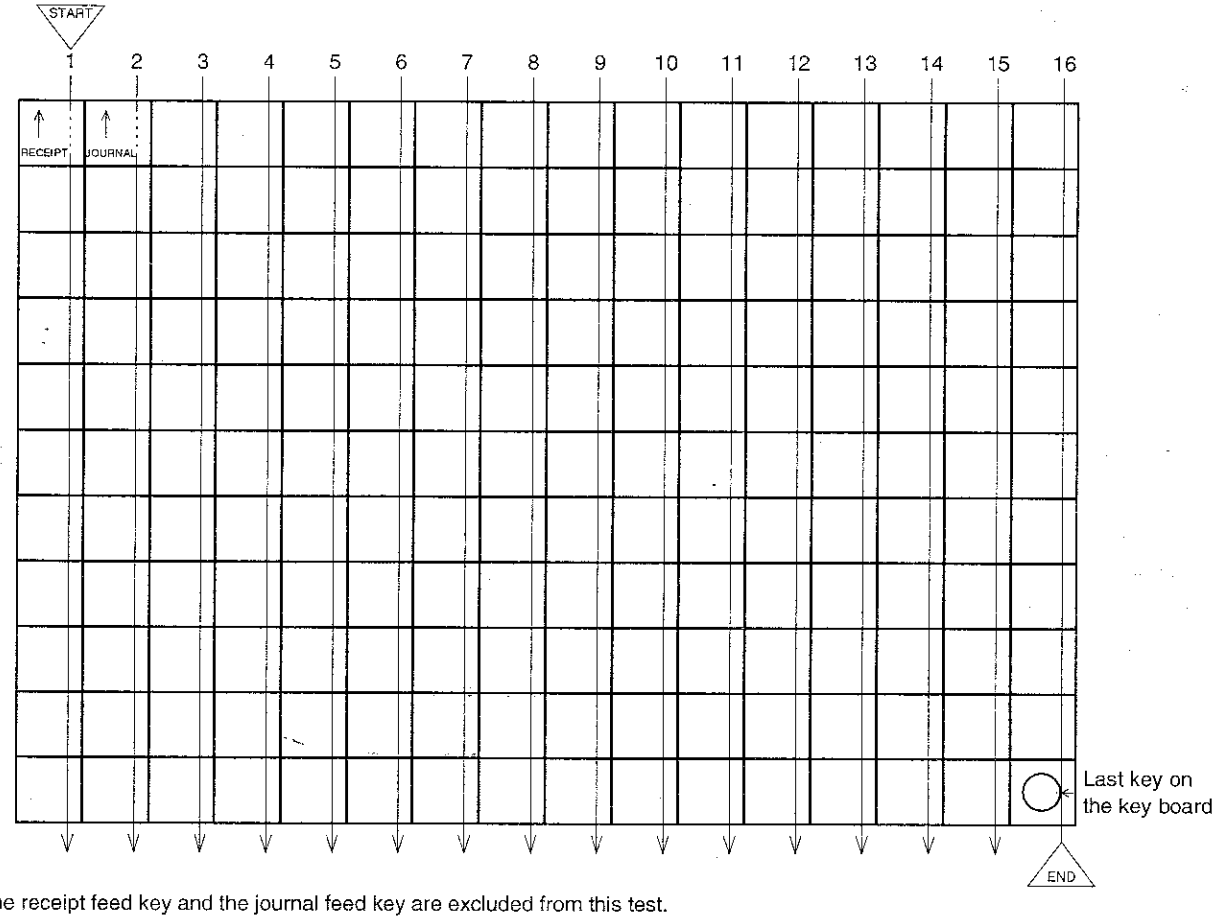
✱✱✱: Key code that caused the error

(Additional description on the program specifications)
When an error occurs during check, the operation is not terminated and the key to be checked on the key table is not incremented and is kept at standby state for being checked.
To terminate compulsorily, press the END key (at the right bottom). In this case also, the error print is not made.
The display specification is as follows:

DOT DISPLAY : K E Y B O A R D S R V .

7SEG DISPLAY : O O O
KEY CODE

[ER-A670]



Note: The receipt feed key and the journal feed key are excluded from this test.

Fig. 3-1: TEST SEQUENSE

↑ RECEIPT	↑ JOURNAL	028	038	048	058	068	078	088	098	108	118	128	138	148	158
009	018	027	037	047	057	067	077	087	097	107	117	127	137	147	157
008	017	026	036	046	056	066	076	086	096	106	116	126	136	146	156
007	016	025	035	045	055	065	075	085	095	105	115	125	135	145	155
006	015	024	034	044	054	064	074	084	094	104	114	124	134	144	154
005	014	023	033	043	053	063	073	083	093	103	113	123	133	143	153
004	013	022	032	042	052	062	072	082	092	102	112	122	132	142	152
003	012	021	031	041	051	061	071	081	091	101	111	121	131	141	151
002	011	020	030	040	050	060	070	080	090	100	110	120	130	140	150
001	010	019	029	039	049	059	069	079	089	099	109	119	129	139	149

Fig. 3-2: KEY CODE TABLE

[5] Mode switch test

① Key operation
105 → TL

② Functional description
This test is applicable for checking of the MODE switch. The MODE switch must be changed as described below to do the test.
Initial state mode: SRV mode
Mode check
Change the MODE switch position in the order given below starting from the SRV position.

DOT DISPLAY : M O D E S W T E S T S R V .

7SEG DISPLAY : X X: 0~7,E,F

Mode: SRV PGM2 PGM1 ⏻ OP X/Z REG
X : 0 1 2 (E) 3 4

SRV X2/Z2 X1/Z1 MGR
0 7 6 5

(X: E-intermediate position, F-multiple errors)

When the mode key settings in the sequence other than specified is met or when any key pushed, the program execution will terminate immediately upon occurrence, with the error printout produced, except for the mode switch in the middle position. To avoid this, the mode switch must be rotated correctly. Because nothing is interrogated until the mode key returns to the SRV position once after the switch has turned to the "X2/Z2" positions, it needs not to be rotated slowly.

③ Check the following items:
Check to see if the following are displayed and that the termination print is produced

④ Test termination
When the test has been completed according to the given procedure, the test automatically terminates with the termination message printed. To terminate the test in the middle of an operation, merely depress any key, then, the test will terminate with the error message printed. When an error was encountered, the test automatically terminates with the error message printed on the printer.

105 | E - - - - 105

Test termination print Error print (any key depression)

[6] Paper end sensor and near end sensor test

The paper end sensor and the near end sensor are optional units.

① Key operation
106 → TL

② Functional description
State of the paper end and near end sensor is sensed and displayed.

③ Check the following items:
On and off actions of the paper end and near end sensors are tested and their results are displayed.
ON/OFF check is performed for VDS and NES and the display is checked.

DOT DISPLAY : R J S E N S O R S R V .

7SEG DISPLAY : x y z

x: State of the RPES sensor
y: State of the JPES sensor
z: State of the NES sensor

Display	X/Y/Z	Description
JPES	O	Paper end sensor (JOURNAL) not detected
	C	Paper end sensor (JOURNAL) detected
RPEG	O	Paper end sensor (RECEIPT) not detected
	C	Paper end sensor (RECEIPT) detected
NES	O	Journal side paper roll near end detected.
	C	Journal side paper roll near end not detected.

NOTE: "C" is always displayed when no sensor is used.

④ Test termination
Any key depression causes the test to terminate with the termination message on printout.

106
Test termination print

[7] BOF, TOF and IFV test

① Key operation
107 → TL

② Functional description
After releasing the paper, the state of BOF, TOF, and IFV sensor are sensed and displayed.

③ Check the following items:
BOF, TOF: Check the paper set condition.
IFV: Check the connection of the ER-31SP slip printer and slip printer interface.
Check the on and off actions.

DOT DISPLAY : S L I P S E N S O R S R V .

7SEG DISPLAY : x y z

x: State of IFV
y: State of the BOF sensor
z: State of the TOF sensor

Display	x/y	Description
IFV	O	Slip printer or slip printer interface not in connection
	C	Slip printer or slip printer interface not in connection
BOF	O	Slip paper not detected
	C	Slip paper detected
TOF	O	Slip paper not detected
	C	Slip paper detected

④ Test termination
Any key depression terminates the test with the termination print.

107
Test termination print

Note 1: Before performing this test, connect the slip printer and the slip printer I/F. If not, "SLIP I/F ERR" occurs.
Note 2: Before turning on/off the connector for IFV checking, be sure to set the mode to other than SRV and turn off the power.

[8] Calendar oscillator test

① Key operation
108 → TL
Functional description
This program is used to test the calendar oscillator function.

DOT DISPLAY : T I M E R C H E C K S R V .

7SEG DISPLAY : * * - * *

-: Present time

② Check the following items:
i) Testing blinking "–". (500ms ON and OFF)

③ Test termination
Any key depression terminates the test with the termination print.

108
Test termination print

[9] SSP test

① Key operation
109 → TL

② Functional description
If an SSP is programmed, its contents are automatically checked and the result is printed.

③ Check the following items:
Check printing of the termination message.

④ Test termination
The test terminates automatically after printing the termination print.

109	E – – – – – 109	F – – – – – 109
Normal end print	Error print	SSP table full print (NOTE)

Note: In this SSP check, set the data for check in the empty area of SSP entry REG and erase the data for check after completion of check. Therefore, SSP setting before check is not cleared. If, therefore, there is no SSP entry REG remained for SSP check, F-print (SSP entry register full print) is performed to terminate the program without check.

[10] Drawer open sensor test

① Key operation
110~113 → TL

② Functional description
The drawer indicated by the job number is opened to check the proper action.
Drawer opened: O indicated
Drawer closed: C indicated
110: Drawer-1: Option drawer
111: Drawer-2: Remote drawer
112: Drawer-3: Remote drawer
113: Drawer-4: Remote drawer

DOT DISPLAY : D R A W E R x S R V .

x: 1~4

7SEG DISPLAY : y

y: O= Drawer opened
C= Drawer closed

③ Check the following items:
a) Check opening of the specified drawer.
b) Check the display indication when the drawer is open and close.

④ Any key depression terminates the test with the termination print.

11X
Test termination print

X: 0~3

[11] Display test-2

① Key operation
116 → TL

② Functional description
The display CGs in CKDC4 are checked. The 256 CGs are grouped into 32 blocks and each 8 characters is displayed on the dot display.
The check start with CG code 00H - 07H, and the following blocks are sequentially displayed when any key is pressed.

DOT DISPLAY : x y : O O O O O O O O S R V .

O: CG display position
xy: The initial code of each block is displayed in hexadecimal (For example, A0, B8)

③ Check the following items.
1. Check that the display is normal.
2. Check that there is no blur, defects, and unevenness.

④ Test termination
To terminate the test, set the mode key to any mode other than SRV mode.

116
Test termination print

[12] SIO test-1

① Key operation
117 → TL

② Functional description
The following two kinds of loopback tests are carried out using the special service tool (UKOG-6704RCZZ) to check the trans and receive data, ready, and not ready signals.
Test-1: Checks ER – DR, RS-CD and RR-CS
Test-2: Checks TXD – RXD

③ Check the following items:
Successful test results must be checked on the display and the termination message print.

④ Test termination

117	EX – – – – 117
	Termination print

X = 1: Non connect error
2: Verify error
3: Hardware error
4: P-OFF
5: Timer overflow error

[13] Standard RAM test

① Key operation
120 → TL

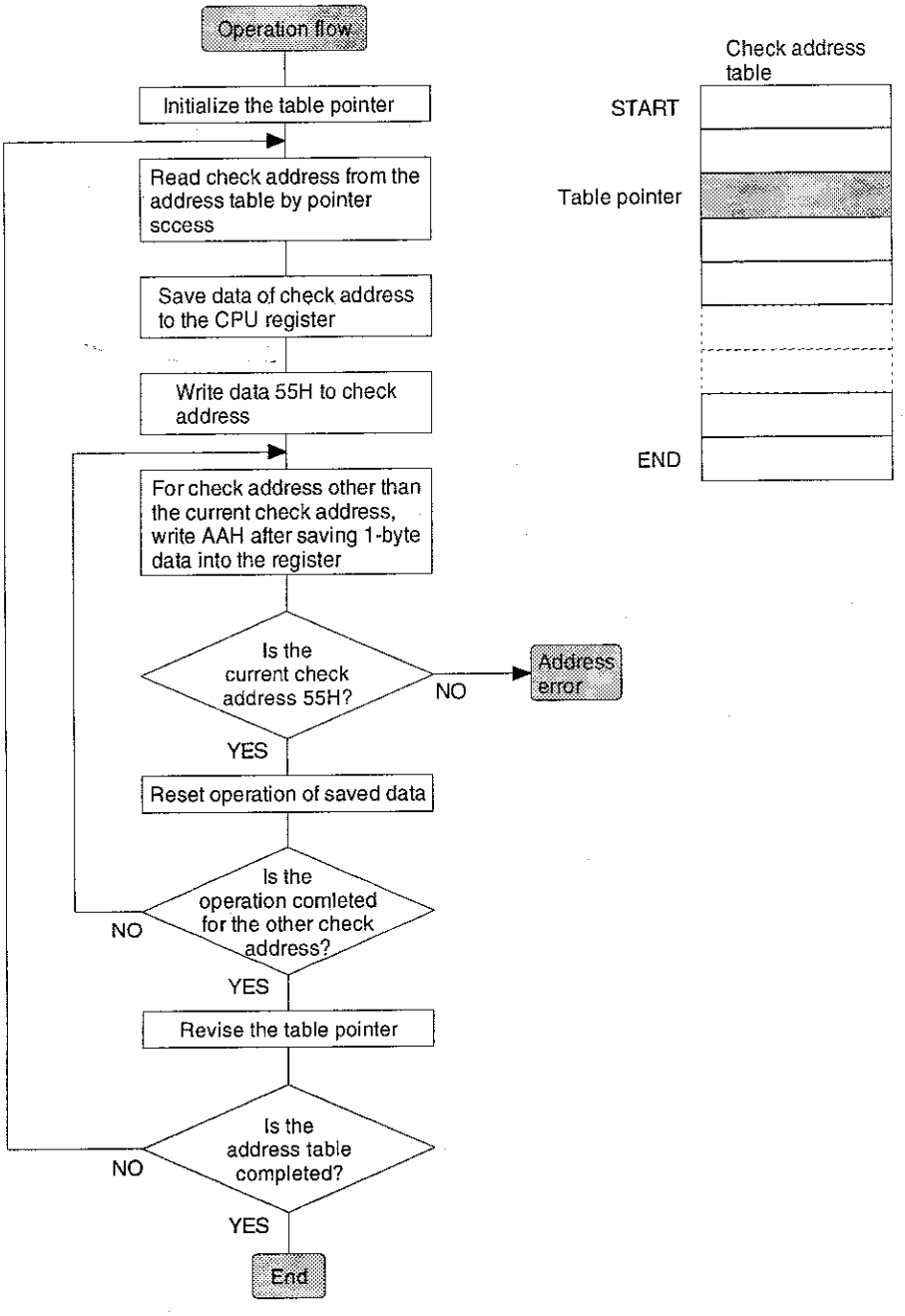
② Functional description
Perform the following check for the standard RAM 128 KByte SRAM. The memory contents should not be changed before and after the check.

Perform the following processes for memory address to be checked (1C0000H~1DFFFFH).
PASS1: Save memory data.

PASS2: Write data "0000H."
PASS3: Read and compare data "0000H," write data "5555H."
PASS4: Read and compare data "5555H," write data "AAAAH."
PASS5: Read and compare data "AAAAH."
PASS6: Restore the memory data.

If a comtare error occurs in the check sequence PASS1-PASS6, an error print is made. If no error occurs through all address, the check ends normally.

The following address check is performed further.
Check point address = 1C0000H, 1C0001H
1C0002H, 1C0004H
1C0008H, 1C0010H
1C0020H, 1C0040H
1C0080H, 1C0100H
1C0200H, 1C0400H
1C0800H, 1C1000H
1C2000H, 1C4000H
1C8000H, 1D0000H


Operation flow
Initialize the table pointer
Read check address from the address table by pointer sccess
Save data of check address to the CPU register
Write data 55H to check address
For check address other than the current check address, write AAH after saving 1-byte data into the register
Is the current check address 55H?
NO
Address error
YES
Reset operation of saved data
Is the operation comleted for the other check address?
NO
YES
Revise the table pointer
Is the address table completed?
NO
YES
End
Check address table
START
Table pointer
END

③ Check the following items:
Check the termination printout.

④ Test termination
The test terminates after printing the termination printout.
Termination printout:

Normal termination		120
Abnormal termination	Ex - - - - -	120
		※※※※※

X = 1: Data check error
2: Address check error

Note: When an error occurs, the error print is performed and the check is terminated. The error occurrence address is shown in hexadecimal at positions shown with ※※※※※.

[14] Standard ROM test

① Key operation
130 → TL

② Functional description
Sum check of the standard ROM (C00000H - C7FFFFH) is performed. If the lower two digits of SUM is 10H, it is normal.

DOT DISPLAY : S - ROM . . . . . SRV.

③ Check the following items:
Check the printout after the test.

④ Test termination
The test automatically terminates with termination message.

Normal termination print		130
	ROM1	27040※※※※※
Error termination print	E - - - -	130
	ROM1	27040※※※※※

Note: "※※※※※" means the ROM version number.
The underlined section (10 bytes) of code table is provided in the ROM as a standard and the table content is always printed.
The table position is the upper 10 digits of the ROM address.
The check sum correction address is the last address -0FH.

[15] A/D conversion check

① Key operation
151 → TL

② Content
The digital conversion value of the input signal to the CPU A/D convertor is displayed sequentially. The display channel is changes in approx. 1 sec interval by timer control and is displayed

DOT DISPLAY : TM . . . . =※※※※ SRV.

repeatedly.

DOT DISPLAY : VRF . . . . =※※※※ SRV.

repeatedly.

DOT DISPLAY : VPTEST =※※※※ SRV.

Thermistor input

VRF input

+24V input

Note: "※※※※": the 10 bit data of the A/D convertor is displayed in decimal number. Therefore, its content may be 0000 - 1024.

③ Confirmation
Check the display content.

④ Termination
To When the mode switch is set to any mode other than SRV mode, the termination print is made and the test is terminated.

106
Test termination print

[16] Option RAM test

① Key operation
20X → TL

JOB #NO.	RAM NO.	Memory to be checked	Address area to be checked
200	Option RAM (main)	ER-01RA	1E0000H ~ 1E7FFFH
201	Option RAM (main)	ER-02RA	1E0000H ~ 1FFFFFH
202	ER-01MB RAM1	ER-02RA+ER-01MB	1E0000H ~ 21FFFFH
203	ER-01MB RAM2	ER-02RA+ (ER-01MB+ER-02RA)	1E0000H ~ 23FFFFH
204	ER-01MB RAM3	ER-02RA+ (ER-01MB+ER-02RAX2)	1E0000H ~ 25FFFFH
205	ER-01MB RAM4	ER-02RA+ (ER-01MB+ER-02RAX3)	1E0000H ~ 27FFFFH
206	ER-02MB	ER-02RA+ER-02MB	1E0000H ~ 2FFFFFH

② Content
The following check are performed for the optional RAM. Do not change the memory contents before and after this check JOB.
The following process is performed for memory address to be checked.

PASS1: memory data save
PASS2: Data "0000H" write
PASS3: Data "0000H" read and comparison, data "5555H" write
PASS4: Data "5555H" read and comparison, data "AAAAH" write
PASS5: Data "AAAAH" read and comparison
PASS6: Memory data restore

If a compare error is found in the check sequence from PASS1 to PASS6, error print (error code E1) is performed. If there is no error found to the end of the last address, the operation is completed normally.

Then the following address check is performed by judging the option chip to be integrated. The check point addresses are as follows:

Check Address	JOB200	JOB201	JOB202	JOB203	JOB204	JOB205	JOB206
1E0000H	O	O	O	O	O	O	O
1E0001H	O	O	O	O	O	O	O
1E0002H	O	O	O	O	O	O	O
1E0004H	O	O	O	O	O	O	O
1E0008H	O	O	O	O	O	O	O
1E0010H	O	O	O	O	O	O	O
1E0020H	O	O	O	O	O	O	O
1E0040H	O	O	O	O	O	O	O
1E0080H	O	O	O	O	O	O	O
1E0100H	O	O	O	O	O	O	O
1E0200H	O	O	O	O	O	O	O
1E0400H	O	O	O	O	O	O	O
1E0800H	O	O	O	O	O	O	O
1E1000H	O	O	O	O	O	O	O
1E2000H	O	O	O	O	O	O	O
1E4000H	O	O	O	O	O	O	O
1E8000H	—	O	O	O	O	O	O
1F0000H	—	O	O	O	O	O	O
200000H	—	—	O	O	O	O	O
210000H	—	—	O	O	O	O	O
220000H	—	—	—	O	O	O	O
240000H	—	—	—	—	O	O	O
260000H	—	—	—	—	—	O	O
280000H	—	—	—	—	—	—	O

"O" in the table shows that the check point address in the horizontal column is valid, and "—" shows it is invalid.
When any error occurs in this address check, error code E2 is printed.

③ Check the following items.
Check the termination print.

④ Test termination
The test terminates after printing the termination printout.

Termination print

Normal termination		20X
Abnormal termination	EY– – – –	20X
		******

20X: JOB # (200~206)
Y: Error code

Note: When an error occurs error print is performed and the error address is displayed in position ****** in hexadecimal.

[17] Option RAM address test

① Key operation
30X → TL (X: 0~6)

JOB #NO.	RAM NO.	Memory to be checked	Address area to be checked
300	Option RAM (main)	ER-01RA	1E0000H ~ 1E7FFFH
301	Option RAM (main)	ER-02RA	1E0000H ~ 1FFFFFH
302	ER-01MB RAM1	ER-02RA+ER-01MB	1E0000H ~ 21FFFFH
303	ER-01MB RAM2	ER-02RA+ (ER-01MB+ER-02RA)	1E0000H ~ 23FFFFH
304	ER-01MB RAM3	ER-02RA+ (ER-01MB+ER-02RAX2)	1E0000H ~ 25FFFFH
305	ER-01MB RAM4	ER-02RA+ (ER-01MB+ER-02RAX3)	1E0000H ~ 27FFFFH
306	ER-02MB	ER-02RA+ER-02MB	1E0000H ~ 2FFFFFH

② Functional description
The following check are performed for the optional RAM. Do not change.

Check Address	JOB300	JOB301	JOB302	JOB303	JOB304	JOB305	JOB306
1E0000H	O	O	O	O	O	O	O
1E0001H	O	O	O	O	O	O	O
1E0002H	O	O	O	O	O	O	O
1E0004H	O	O	O	O	O	O	O
1E0008H	O	O	O	O	O	O	O
1E0010H	O	O	O	O	O	O	O
1E0020H	O	O	O	O	O	O	O
1E0040H	O	O	O	O	O	O	O
1E0080H	O	O	O	O	O	O	O
1E0100H	O	O	O	O	O	O	O
1E0200H	O	O	O	O	O	O	O
1E0400H	O	O	O	O	O	O	O
1E0800H	O	O	O	O	O	O	O
1E1000H	O	O	O	O	O	O	O
1E2000H	O	O	O	O	O	O	O
1E4000H	O	O	O	O	O	O	O
1E8000H	—	O	O	O	O	O	O
1F0000H	—	O	O	O	O	O	O
200000H	—	—	O	O	O	O	O
210000H	—	—	O	O	O	O	O
220000H	—	—	—	O	O	O	O
240000H	—	—	—	—	O	O	O
260000H	—	—	—	—	—	O	O
280000H	—	—	—	—	—	—	O

"O" in the table shows that the check point address is valid, and "—" shows that it is invalid.

③ Check the following items.

Check the termination print.

④ Test termination
The test terminates after printing the termination printout.

Termination printout

Normal termination		30X
Abnormal termination	EY- - - - -	30X
		*******

30X: JOB# (300~306)
Y: Error code

Note: When an error occurs error print is performed and the error address is displayed in position ******* in hexadecimal.

[18] Option ROM test

① Key operation:
400 → TL

② Functional description:
A sum check is done for the option ROM (Address hex C80000H thru CBFFFFH.)

③ Check the following items:
Check the termination printout.

④ Test termination:
The test terminates after printing the termination printout.
Termination printout

Normal termination		400
	ROM	27020*****
	E- - - - -	400
	ROM	27020*****

The underlined section must be the same as the standard ROM test specification. (Refer to JOB #130.)

CHAPTER 6. DOWN LOAD FUNCTION

1. General

RAM data can be transmitted in the following two methods.
Save the data before servicing as follows:

① ECR ⟷ ECR

- Cable: ER-A5CB

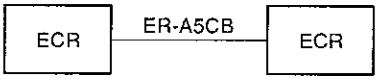


Fig. 1-1

② ECR ⟷ ER-02FD

- Cable: Cable (QCNW-7578RCZZ) packed with the ER-02FD

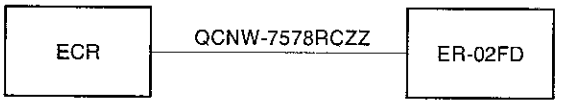


Fig. 1-2

2. SIO interface specification

1) Operation: Simplex
2) Line configuration: Direct connect
3) Data rate: 19200, 9600, 4800, 2400, 1200, 600, 300BPS (Selected by SRV JOB#903-A)
4) Sync mode: Asynchronous
5) Checking: Vertical parity (odd)
6) Code: 7 bits (ASCII)
7) Bit sequence: LSB first
8) Line level: TTL level
9) Data forma:

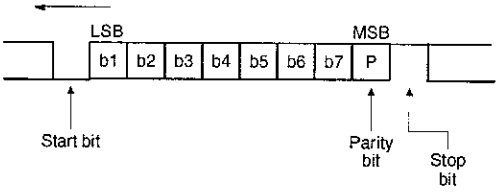


Fig. 2-1

3. Location of connector pins

① ER-A5CB

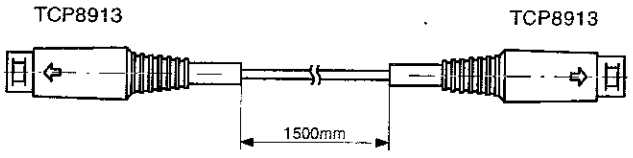


Fig. 3-1

Signal name	Pin No.
GND	1
$\overline{ER}$	2
$\overline{CD}$	3
$\overline{RR}$	4
$\overline{CS}$	5
$\overline{DR}$	6
RXD	7
TXD	8
$\overline{RS}$	9

Pin No.	Signal name
1	GND
2	$\overline{ER}$
3	$\overline{DR}$
4	RXD
5	TXD
6	$\overline{CD}$
7	$\overline{RR}$
8	$\overline{CS}$
9	$\overline{RS}$

Fig. 3-2

② QCNW-7578RCZZ

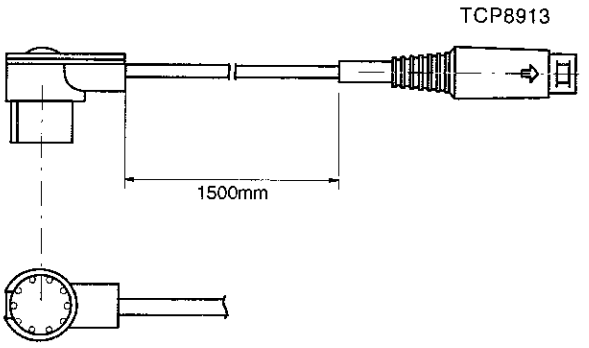


Fig. 3-3

Signal name	Pin No.
GND	1
NC	2
$\overline{ER}$	3
$\overline{CD}$	4
$\overline{RR}$	5
$\overline{CS}$	6
$\overline{DR}$	7
RXD	8
TXD	9
$\overline{RS}$	10

NC

Pin No.	Signal name
1	GND
2	$\overline{ER}$
3	$\overline{DR}$
4	RXD
5	TXD
6	$\overline{CD}$
7	$\overline{RR}$
8	$\overline{CS}$
9	$\overline{RS}$

Fig. 3-4

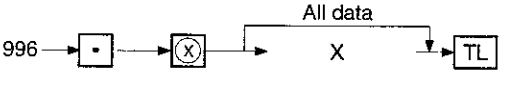
Interfacing signals

Pin No.	Signal name	In/Out	On level	Description
1	GND	—	—	Signal ground
2	$\overline{ER}$	Out	Low	Equipment ready
3	$\overline{DR}$	In	Low	Data set ready
4	RXD	In	High: MARK Low: SPACE	Receive data
5	TXD	Out	High: MARK Low: SPACE	Transmit data
6	$\overline{CD}$	In	Low	Carrier detect
7	$\overline{RR}$	Out	Low	Ready to receive
8	$\overline{CS}$	In	Low	Clear to send
9	$\overline{RS}$	Out	Low	Request to send

4. Application specification

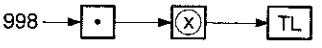
The following service (SRV) modes are available for the serial data transfer of the ER-A670.

1) Data transmit (Source side)



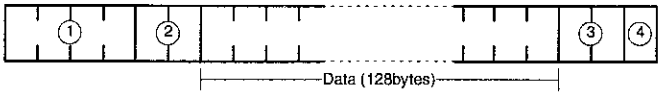
X: 0=SSP DATA
1 = Standard RAM+01RA/02RA
2 = 01MB (0.5MB)/02MB (0.5MB:1st half)
3 = 02MB (0.5MB: 2nd half)

2) Data receive (Target)



5. Data format

A single byte image of the RAM data to be transmitted is divided into a high order 4 bits and low order 4 bits and converted into ASCII code. Then, the image of the memory is sent in the following format:



① Memory top address: 0000H ~ FFFFH
Top address of the memory to be transmitted in ASCII number.

② Page:1D ~ 1F
Page of the memory to be transmitted in ASCII number.

③ Sum check

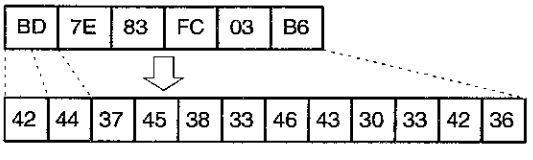
④ End code:
Hex 0D

NOTE:

- In order that contents of RAM memory may not over-ride pages for this job, RAM image is sent in unit of 64 bytes from the address 0000. In other words, 128 bytes are sent at one time on the transmit data format.

RAM DATA FORMAT

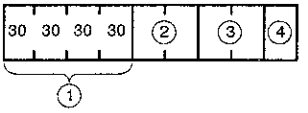
Exhibit:



Code table

HEX	ASCII	Character
0	30	0
1	31	1
2	32	2
3	33	3
4	34	4
5	35	5
6	36	6
7	37	7
8	38	8
9	39	9
A	41	A
B	42	B
C	43	C
D	44	D
E	45	E
F	46	F

6. END record



① End message:
Fixed to 30303030.

② End massage:
Fixed to 4646.

③ Sum check

④ End code:
CR (0D)

7. Operational method

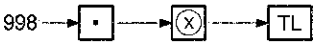
1) To prepare an ER-A670 to receive data from another ER-A670 or the ER-02FD, the memory size of the receiving unit must the same as or greater than the sending unit.

2) Master reset the receiving ER-A670.

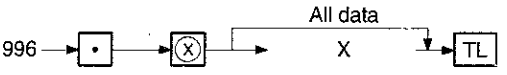
3) Match the baud rate of the transmitter with the receiver using JOB#995 in the SRV mode.

4) Connect loader cable (QCNW-7578RCZZ or ER-A5CB) between ER-A670s.

5) Set the receiving ER-A670 ready to receive.



6) Start the sending ER-A670.



X: 0 = SSP
1 = Standard RAM+01RA/02RA
2 = 01MB (0.5MB)/02MB (0.5MB:1st half)
3 = 02MB (0.5MB: 2nd half)

7) Transmission status.
Description of error status
1: Application error (Command error)
2: Line error (DTR OFF)
3: Application error (Parity error)
4: Application error (Check sum error)
5: Application error (Data size error)
6: Hard ware error
7: Power off error
10: Time out error
11: Application error (Transmit data size error)
12: Application error (Block sequence error)
13: Memory full error

8) Service reset the receiving ER-A670.

8. Saving/Loading of data to/From the FD unit Configuration

1) Turn off the power switch of the ER-02FD, and set the DIP switches of the FD unit as follows:

ER-02FD (The ER-01FD functions of the ER-02FD are used.)

DS-1								DS-2			
1	2	3	4	5	6	7	8	1	2	3	4
OFF	ON	OFF	ON	ON	OFF	OFF	OFF	X	OFF	OFF	OFF

Data rate

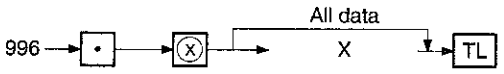
4	6	Rate [bps]
OFF	OFF	19200
ON	OFF	9600
OFF	ON	4800
ON	ON	2400

Disk format
CCP/M: OFF
PC-DOS: ON

2) Connect the QCNW-7578RCZZ cable.

Saving data

1) Turn on the power switch and insert a floppy disk which has been formatted.
2) Start the SEND JOB on the ECR side as follows:

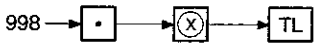


X: 0 = SSP
1 = Standard RAM+01RA/02RA
2 = 01MB (0.5MB)/02MB (0.5MB:1st half)
3 = 02MB (0.5MB: 2nd half)

3) Data transmission is started and the green lamp on the ER-02FD blinks.

Loading data

1) Turn on the power switch and insert the floppy disk which stores the data.
2) Start the RECEIVE JOB on the ECR side as follows:



3) Press the [SEND] key on the FD unit.
4) Data transmission is started and the Green lamp on the ER-02FD blinks.
5) Service reset the ECR.

CHAPTER 7. SERVICE PRECAUTION

1. Hints and tips when installing the RAM chip option (ER-02RA)

1) When the RAM option (ER-02RA) is to be installed to the main PWB, be sure that the ER-02RA is facing in the right direction.

2. In case of power failure

When power is lost, the machine retains its memory contents and all information on sales entries.
When power failure is encountered in register idle state or during an entry, the machine returns to the normal state of operation after power recovery.

3. In case of printer's error

1) When the paper on the themal-head is empty, the printing stalls, the message "PAPER EMPTY" is displayed, and key entries can not be accepted.
   1. Insert the roll paper and feed it to the proper position.
   2. Press the [CL] key. Then the printer prints the error symbol (same as the power failure symbol) and resumes printing.
2) When the termal-head heads up, the printing stalls, the message "HEAD UP" is displayed, and key entries can not be accepted.
   In thet case, following operations will release that state.
   1. Replace the themal-head to the correct position.
   2. Press the [CL] key. Then the printer prints the error symbol (same as the power failure symbol) and resumes printing.
3) When the printer error by the paper jumbling or the other reasons occurs, the printing stalls, intermitten bleeping starts, and key entries can not be accepted.
   In that case, following operations (in any modes except ⏻ mode) will release the printer error state.
   ① Turn off Power Switch.
   ② Repair the paper jumbling or the other reasons
   ③ Turn on the Power Switch. Then the message "PRINTER ERROR" is displayed.
   ④ Feed the roll paper to the proper position.
   ⑤ Press the [CL] key. Then the printer prints the power failure symbol and resumes printing.

4. Note for upper cabinet installation

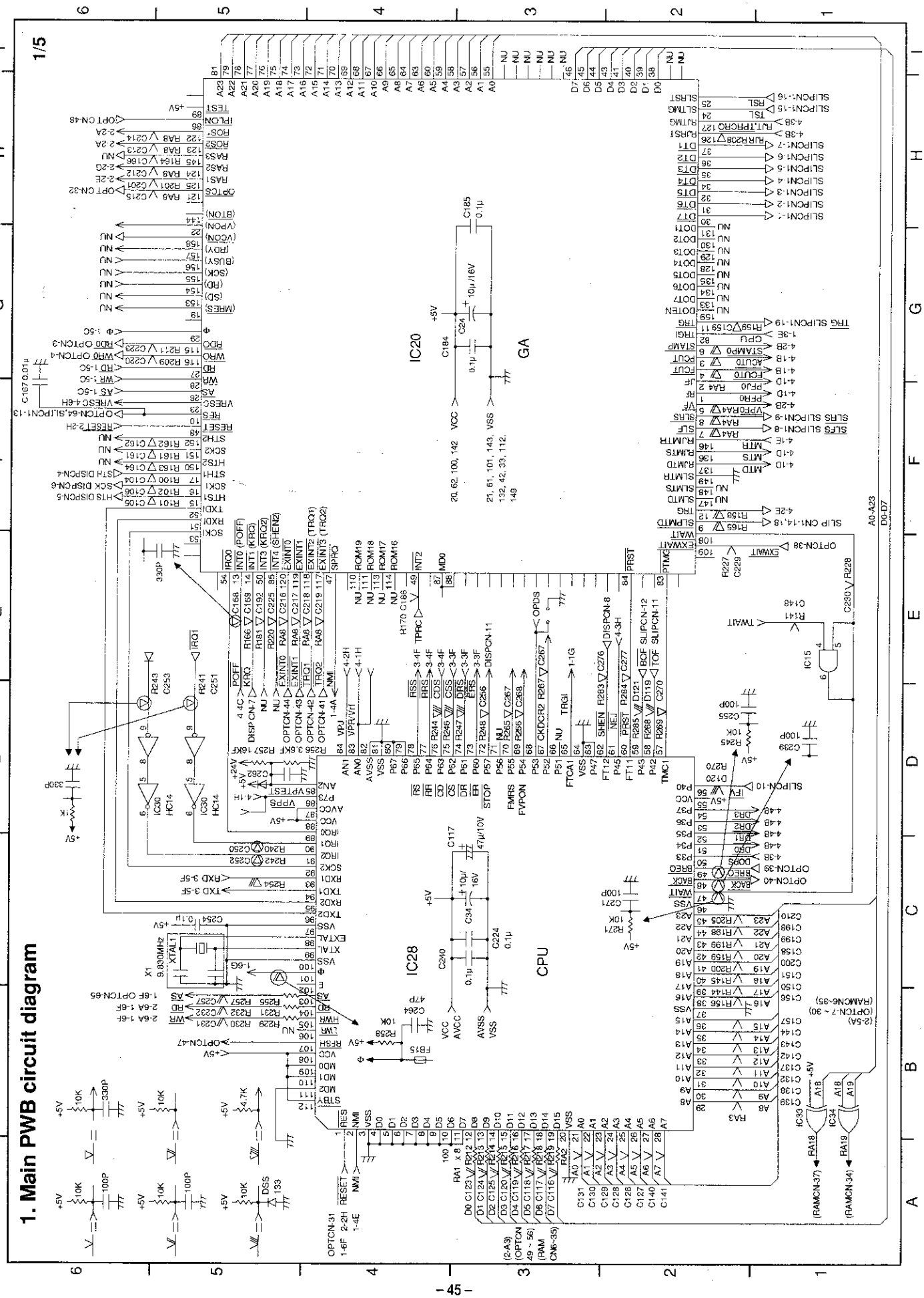
When installing the upper cabinet again, be sure to connect the GND wire (QCNW-7120RCZZ) to the proper connector in front of the printer.

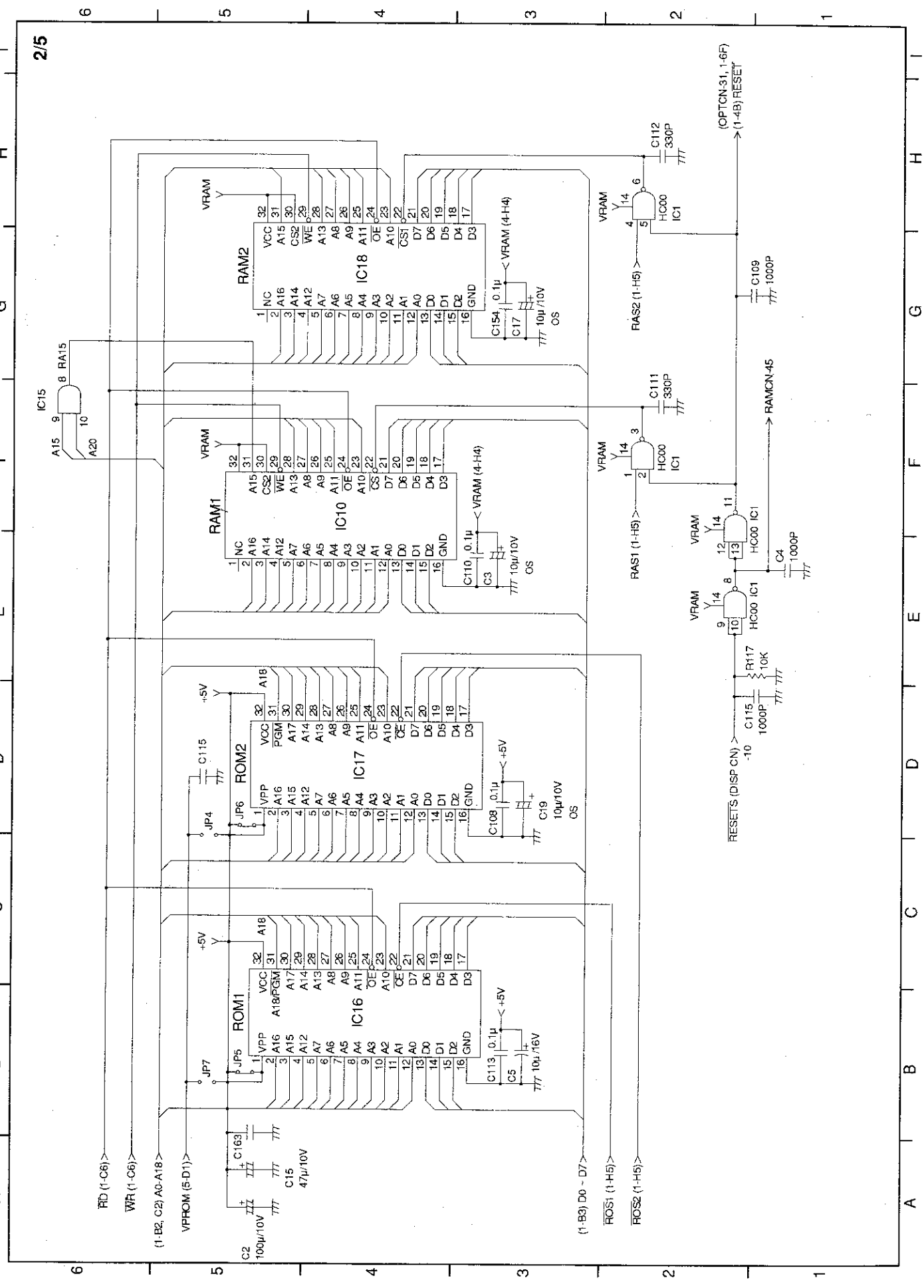
5. Cares when handling the thermal head of the printer

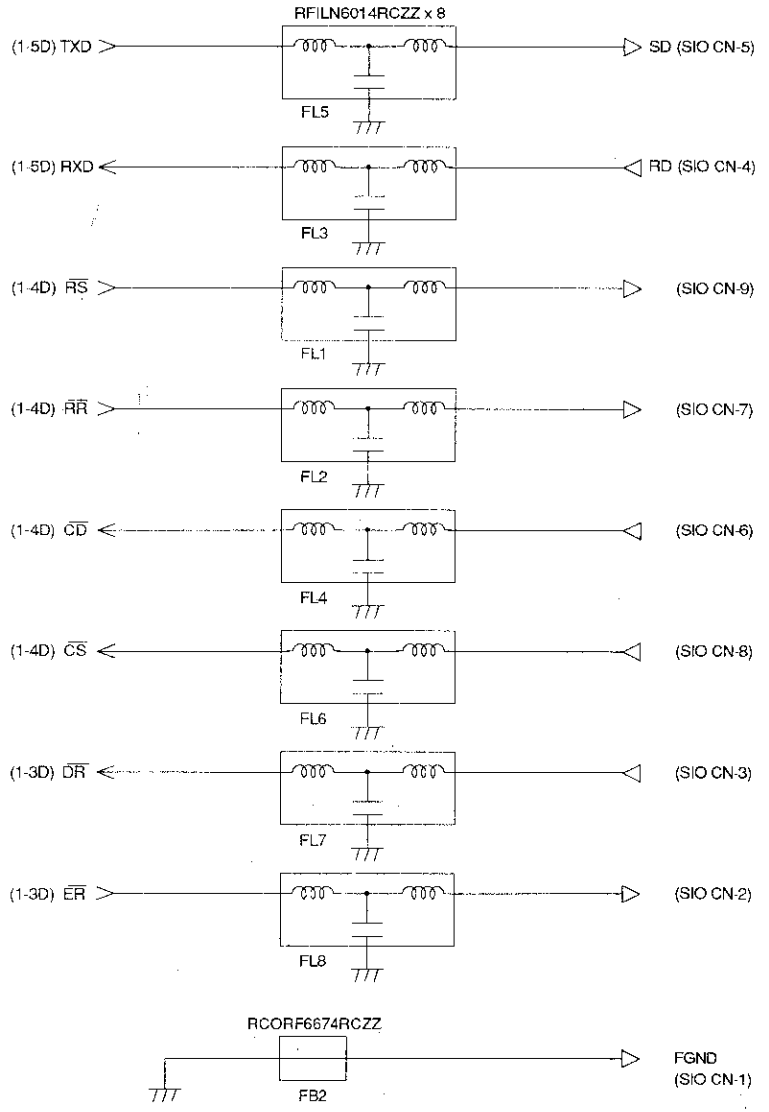
1) Be sure to take countermeasures for static electricity when handling the thermal head-ECR.
   (Use a conductive mat and wear a wrist band while working. Note that an ionizer should be used when relative humidity is 40% or less.)
2) Be careful not to touch the printing surface and connector terminals of the thermal head-ECR.
   If any foreign matter is found on the printing surface, clean it by wiping it using a cotton swab soaked wirh alcohol.

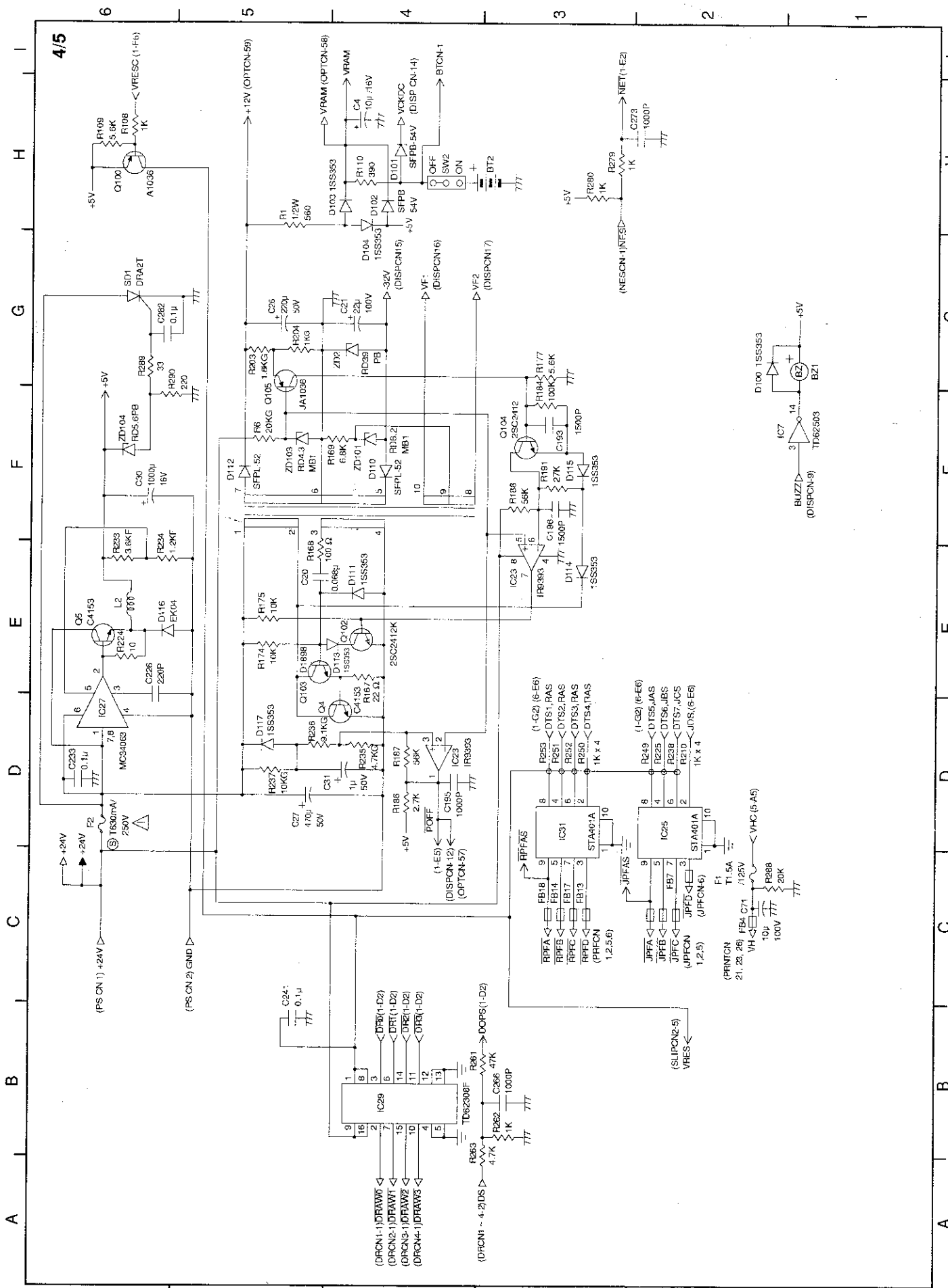
CHAPTER 8. CIRCUIT DIAGRAM & PWB LAYOUT

1. Main PWB circuit diagram

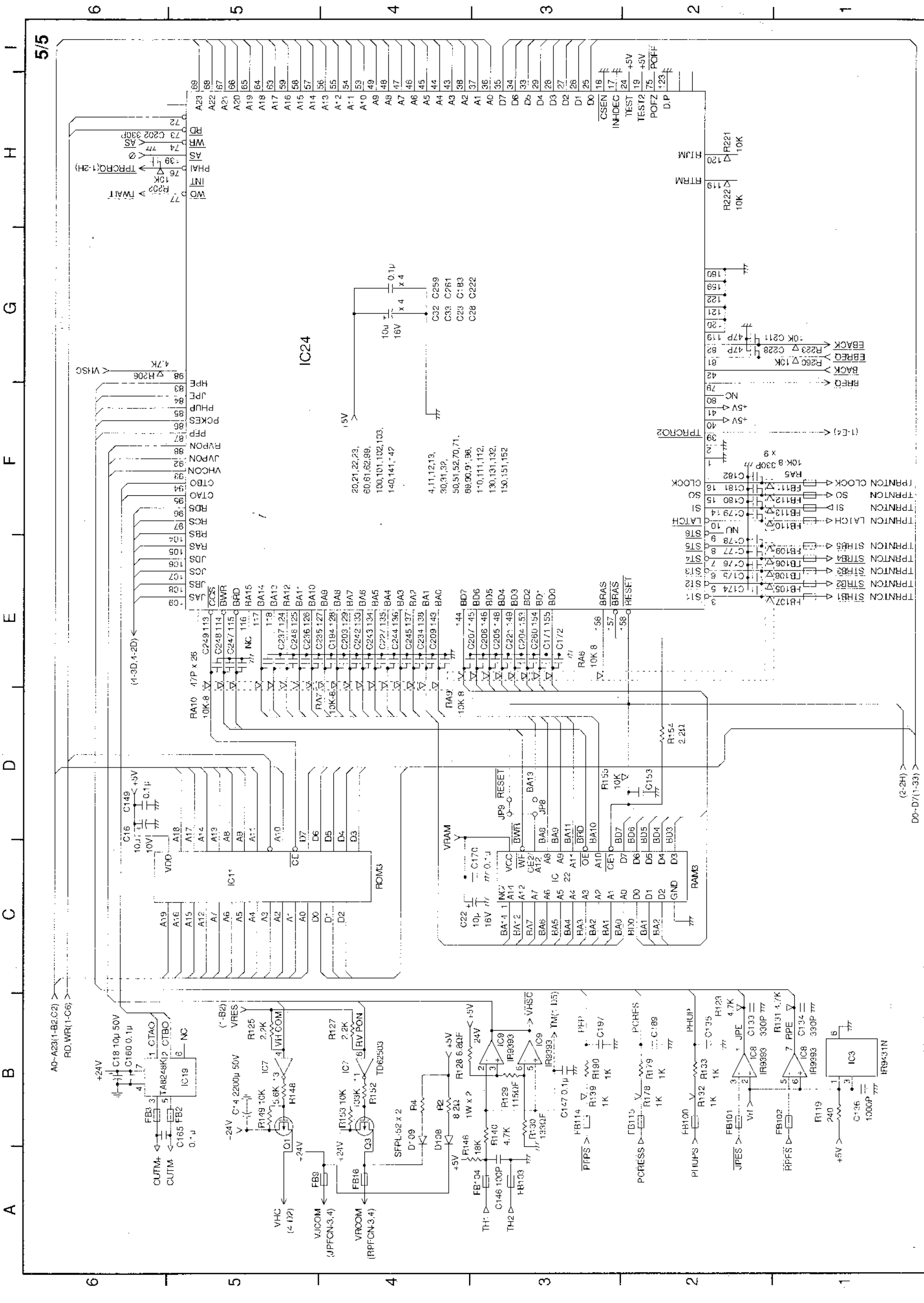



2/5
IC16 ROM1
IC17 ROM2
IC10 RAM1
IC18 RAM2
IC15
HC00 IC1
RA15
VRAM
VRAM (4-H4)
(OPTCN-31, 1-6F)
(1-4B) RESET
RAMCN-45
RAS1 (1-H5)
RAS2 (1-H5)
RESETS (DISP CN)
RD (1-C6)
WR (1-C6)
(1-B2, C2) A0-A18
VPROM (5-D1)
(1-B3) D0 ~ D7
ROS1 (1-H5)
ROS2 (1-H5)
C15 47µ/10V
C2 100µ/10V
C163
C115 1000P
C109 1000P
C4 1000P
C111 330P
C112 330P
R117 10K
C110 0.1µ
C3 10µ/10V
C154 0.1µ
C17 10µ/10V
C108 0.1µ
C19 10µ/10V
C113 0.1µ
C5 10µ/16V
JP4
JP5
JP6
JP7
+5V


RFILN6014RCZZ x 8
(1-5D) TXD
SD (SIO CN-5)
FL5
(1-5D) RXD
RD (SIO CN-4)
FL3
(1-4D) RS
(SIO CN-9)
FL1
(1-4D) RR
(SIO CN-7)
FL2
(1-4D) CD
(SIO CN-6)
FL4
(1-4D) CS
(SIO CN-8)
FL6
(1-3D) DR
(SIO CN-3)
FL7
(1-3D) ER
(SIO CN-2)
FL8
RCORF6674RCZZ
FGND
(SIO CN-1)
FB2


4/5
+12V (OPTCN-59)
VRAM (OPTCN-58)
VRAM
VCKDC (DISP CN-14)
BTCN-1
VRESC (1-F6)
NET (1-E2)
(NESCN-1)NFES
-32V (DISPCN15)
VF- (DISPCN16)
VF2 (DISPCN17)
(PS CN 1) +24V
(PS CN 2) GND
BUZZ (DISPCN-9)
(DRCN1-1)DRAW0
(DRCN2-1)DRAW1
(DRCN3-1)DRAW2
(DRCN4-1)DRAW3
(DRCN1 ~ 4-2)DS
(SLIPCN2-5) VRES
(PRNTCN 21, 23, 26) VH
(DISPCN-12) (OPTCN-57)
(JPFCN 1,2,5)
(PRFCN 1,2,5,6)
(1-G2) (6-E6)
(1-E5)
(JPFCN-6)
F1 T1.5A /125V
F2 T630mA/ 250V
MC34063
TD62308F
TD62503
IR9393
STA401A
2SC2412K
2SC2412
SFPL-52
SFPB-54V
SW2
OFF
ON
BT2
BZ1
IC27
IC29
IC31
IC25
IC7
IC23
Q5 C4153
Q4 C4153
Q103 D1898
Q102
Q105 JA1036
Q104 2SC2412
Q100 A1036
S01 DTA2T
D112 SFPL-52
D110 SFPL-52
D111 1SS353
D113 1SS353
D114 1SS353
D115 1SS353
D116 EK04
D117 1SS353
D100 1SS353
D101 SFPB
D102 SFPB
D103 1SS353
D104 1SS353
ZD104 RD5.6PB
ZD102 RD39 PB
ZD103 RD4.3 MB1
ZD101 RD6.2 MB1
L2 000
R1 1/2W 560
R6 20KG
R109 5.6K
R108 1K
R110 390
R111 100K
R177 5.6K
R184 100K
R191 27K
R195 56K
R196 1500P
R203 1.8KG
R204 1KG
R289 33
R290 220
R233 3.6KF
R234 1.2KF
R224 10
R226 220P
R168 3 100Ω
R169 6.8K
R175 10K
R174 10K
R167 22Ω
R236 9.1KG
R235 4.7KG
R237 10KG
R187 56K
R186 2.7K
R253 R251 R252 R250 1K x 4
R249 R225 R238 R210 1K x 4
R261 47K
R262 1K
R263 4.7K
R280 1K
R279 1K
R288 20K
C30 1000μ 16V
C26 220μ 50V
C21 22μ 100V
C4 10μ /16V
C282 0.1μ
C233 0.1μ
C20 0.068μ
C31 1μ 50V
C27 470μ 50V
C195 1000P
C196 1500P
C193 1500P
C273 1000P
C266 1000P
C24 0.1μ
C71 10μ 100V
FB18 FB14 FB17 FB13
FB5 FB7
RPFAS
JPFAS
RPFA RPFB RPFC RPFD
JPFA JPFB JPFC JPFD
VH
+24V
+5V
-5V

5/5


IC24
ROM3
IC11
RAM3
IC22
IC19
TA8248K
IC7
TD62503
IC9
IR9393
IC8
IR9393
IC3
IR9431N
A0~A23(1-B2,C2)
RD,WR(1-C6)
D0~D7(1-33)
(2-2H)
(1-3D,4-2D)
TPRCRQ(1-2H)
TPRCRQ2
VHSC
VRES
VHC
VJCOM
VROOM
CUTM+
CUTM-
TPRNTCN CLOCK
TPRNTCN SO
TPRNTCN SI
TPRNTCN LATCH
TPRNTCN STRB1
TPRNTCN STRB2
TPRNTCN STRB3
TPRNTCN STRB4
TPRNTCN STRB5
EBACK
EBREQ
BACK
BREQ
PFPS
PCRESS
PHUPS
JPES
RPFS
TH1
TH2

2. Main PWB conector table

OPT CN

SIGNAL	PIN	PIN	SIGNAL
GND	1	35	GND
GND	2	36	GND
RDO	3	37	RD
WRO	4	38	EXWAIT
+5V	5	39	BREQ
+5V	6	40	BACK
A23	7	41	TRQ2
A22	8	42	TRQ1
A21	9	43	EXINT1
A20	10	44	EXINT0
A19	11	45	TRRQ(IRQ1)
A18	12	46	RSRQ(IRQ2)
A17	13	47	RFSH
A16	14	48	IPLON
A15	15	49	D7
A14	16	50	D6
A13	17	51	D5
A12	18	52	D4
A11	19	53	D3
A10	20	54	D2
A9	21	55	D1
A8	22	56	D0
A7	23	57	POFF
A6	24	58	VRAM
A5	25	59	+12V
A4	26	60	A3
+24V	27	61	+24V
+24V	28	62	+24V
A1	29	63	A2
A0	30	64	RES
RESET	31	65	AS
OPTCS	32	66	WR
GNDP	33	67	GND
GNDP	34	68	GND

TPRNT CN

SIGNAL	PIN	PIN	SIGNAL
VH	1	2	VH
VH	3	4	GND
GND	5	6	GND
SO *1	7	8	SI *1
CLOCK	9	10	GND
LATCH	11	12	GND
STRB5	13	14	+5V
STRB3	15	16	STRB4
STRB1	17	18	STRB2
TM1	19	20	TM2
GND	21	22	GND
GND	23	24	VH
VH	25	26	VH
GND	27	28	RPES
JPES	29	30	+5V
PHUPS	31	32	GND

*1: SI of printer side
*2: SO of printer side

DISP CN

PIN	SIGNAL
1	GND
2	GND
3	+5V
4	STH
5	HTS
6	SCK
7	KRQ
8	SHEN
9	BUZZ
10	RESETS
11	STOP
12	POFF
13	GND
14	VCKDC
15	-32V
16	VF1
17	VF2
18	GND

C100, C101, C102, C103

NES CN

PIN	SIGNAL
1	NES
2	GND

DR CN1

PIN	SIGNAL
1	DS
2	DRAW0
3	+24V

DR CN2

PIN	SIGNAL
1	DS
2	DRAW1
3	+24V

DR SP3

PIN	SIGNAL
1	DRAW2
2	DS
3	+24V

DR SP4

PIN	SIGNAL
1	DRAW3
2	DS
3	+24V

SIO CN

PIN	SIGNAL
1	GND-5
2	ER
3	DR
4	RXD
5	TXD
6	CD
7	RR
8	CS
9	RS

FB1

SLIP CN1

PIN	SIGNAL
1	DT7
2	DT6
3	DT5
4	DT4
5	DT3
6	DT2
7	DT1
8	SLFS
9	SLRS
10	IFV
11	TOF
12	BOF
13	RES
14	M240
15	TSL
16	RSL
17	NU
18	MTDS
19	TRG
20	NU

PS CN

PIN	SIGNAL
1	+24V
2	GND

SLIP CN2

PIN	SIGNAL
1	+24V
2	GNDP
3	+5V
4	GND
5	VRES

RPF CN

PIN	SIGNAL
1	RPFA
2	RPFC
3	VRCOM
4	VRCOM
5	RPFB
6	RPFD

JPF CN

PIN	SIGNAL
1	JPFA
2	JPFC
3	VJCOM
4	VJCOM
5	JPFB
6	JPFD

CUT CN

PIN	SIGNAL
1	PFPS
2	PCRESS
3	GND
4	CUTM+
5	CUTM-

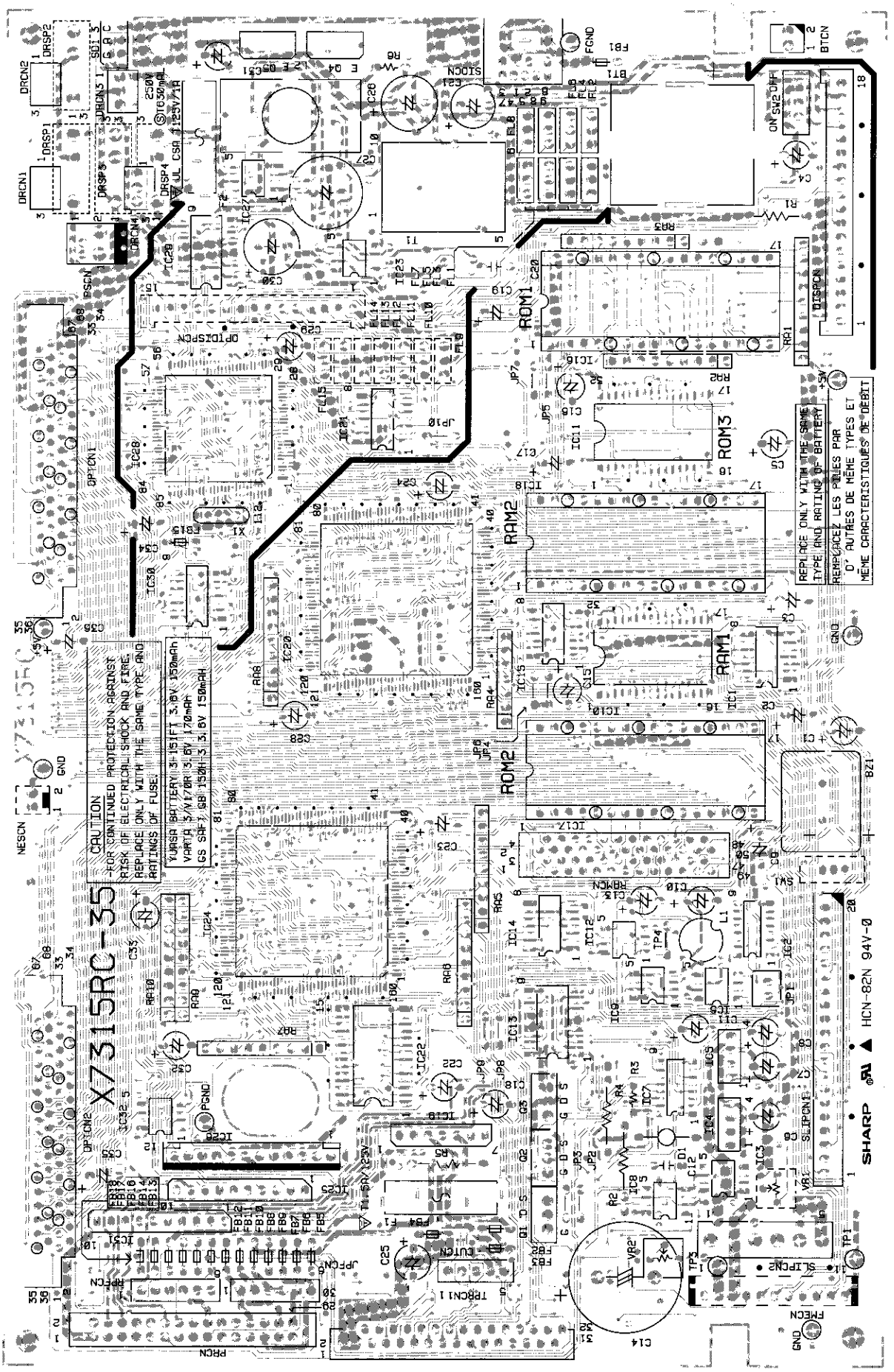
BT CN

PIN	SIGNAL
1	VBT
2	GND

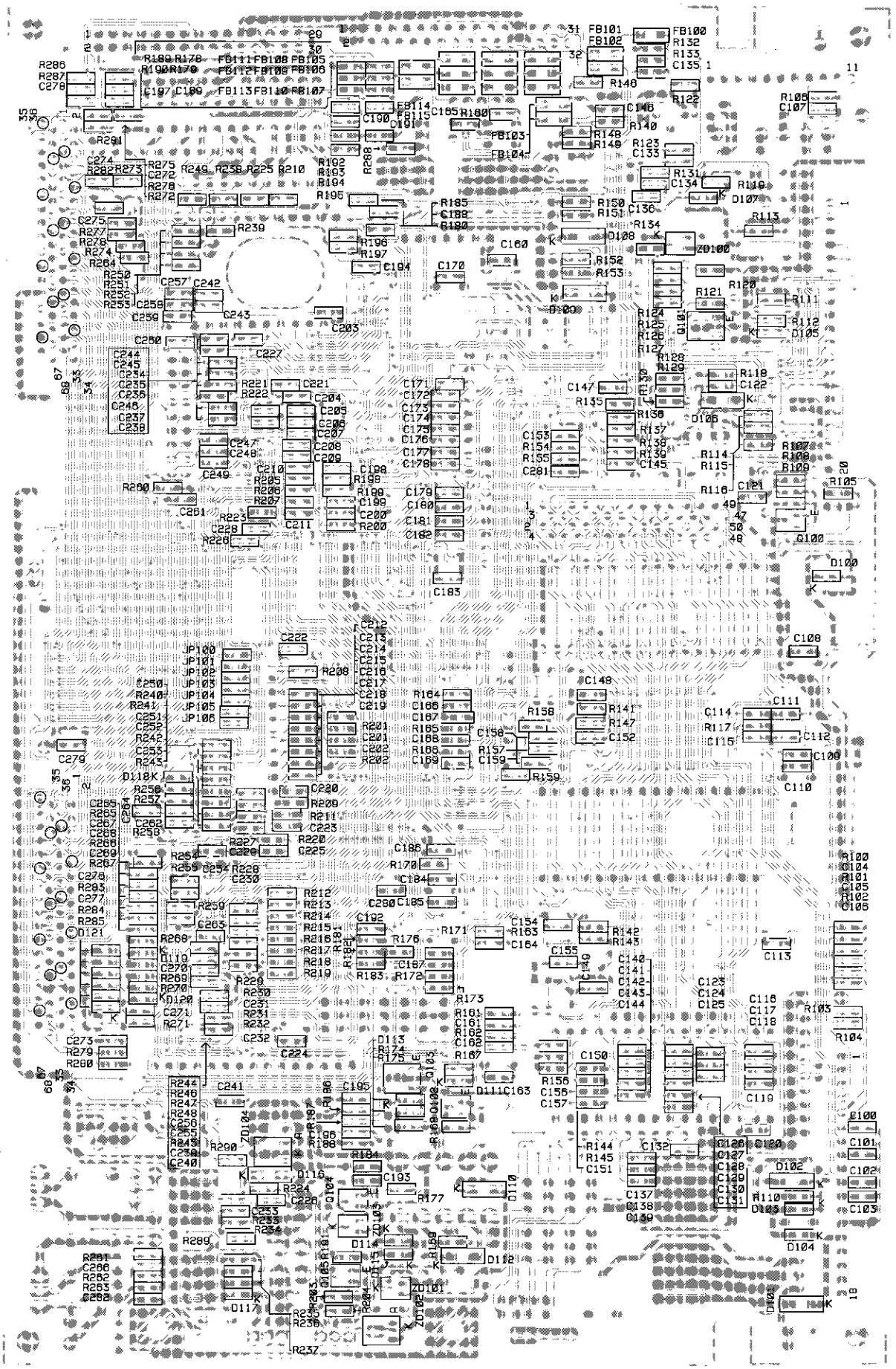
RAM CN

SIGNAL	PIN	PIN	SIGNAL
GND	1	2	GND
GND	3	4	GND
RFSH	5	6	A20
+5V	7	8	+5V
+5V	9	10	+5V
VRAM	11	12	VRAM
VRAM	13	14	VRAM
A16	15	16	A15
A14	17	18	WR
A12	19	20	A13
A7	21	22	A8
A6	23	24	A9
A5	25	26	A11
A4	27	28	RD
A3	29	30	A10
A2	31	32	A17
A1	33	34	RA19
A0	35	36	RAS3
RA18	37	38	D7
D0	39	40	D6
D1	41	42	D5
D2	43	44	D4
RESET	45	46	D3
GND	47	48	GND
GND	49	50	GND

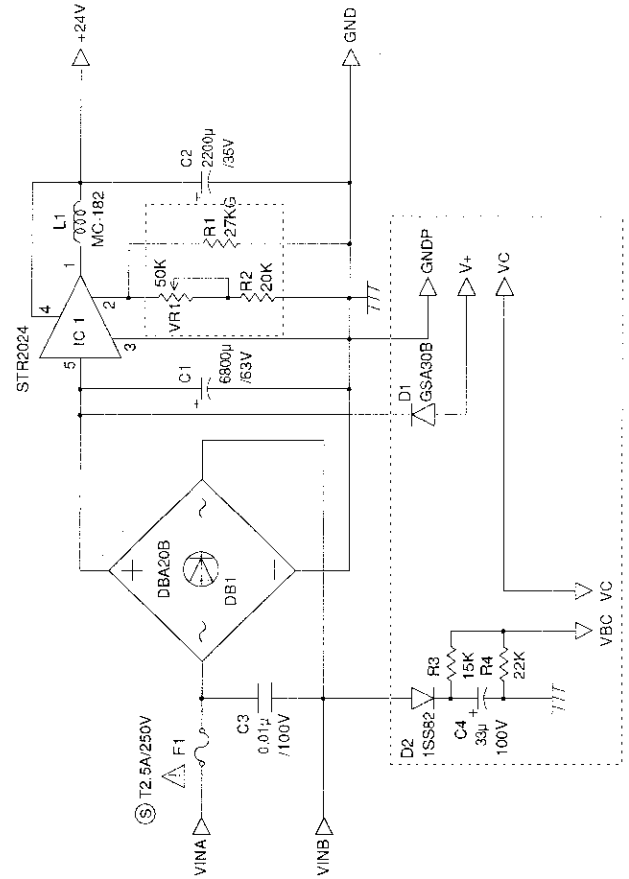
3. Main PWB layout (Parts side)



4. Main PWB layout (Solder side)



5. Power supply PWB circuit diagram



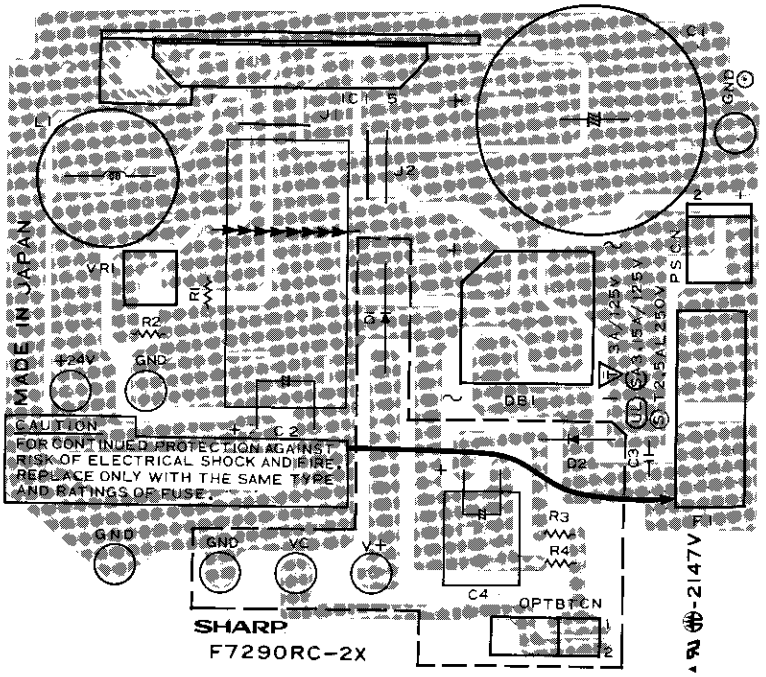
VIN CN

PIN	SIGNAL
1	VINA
2	VINB

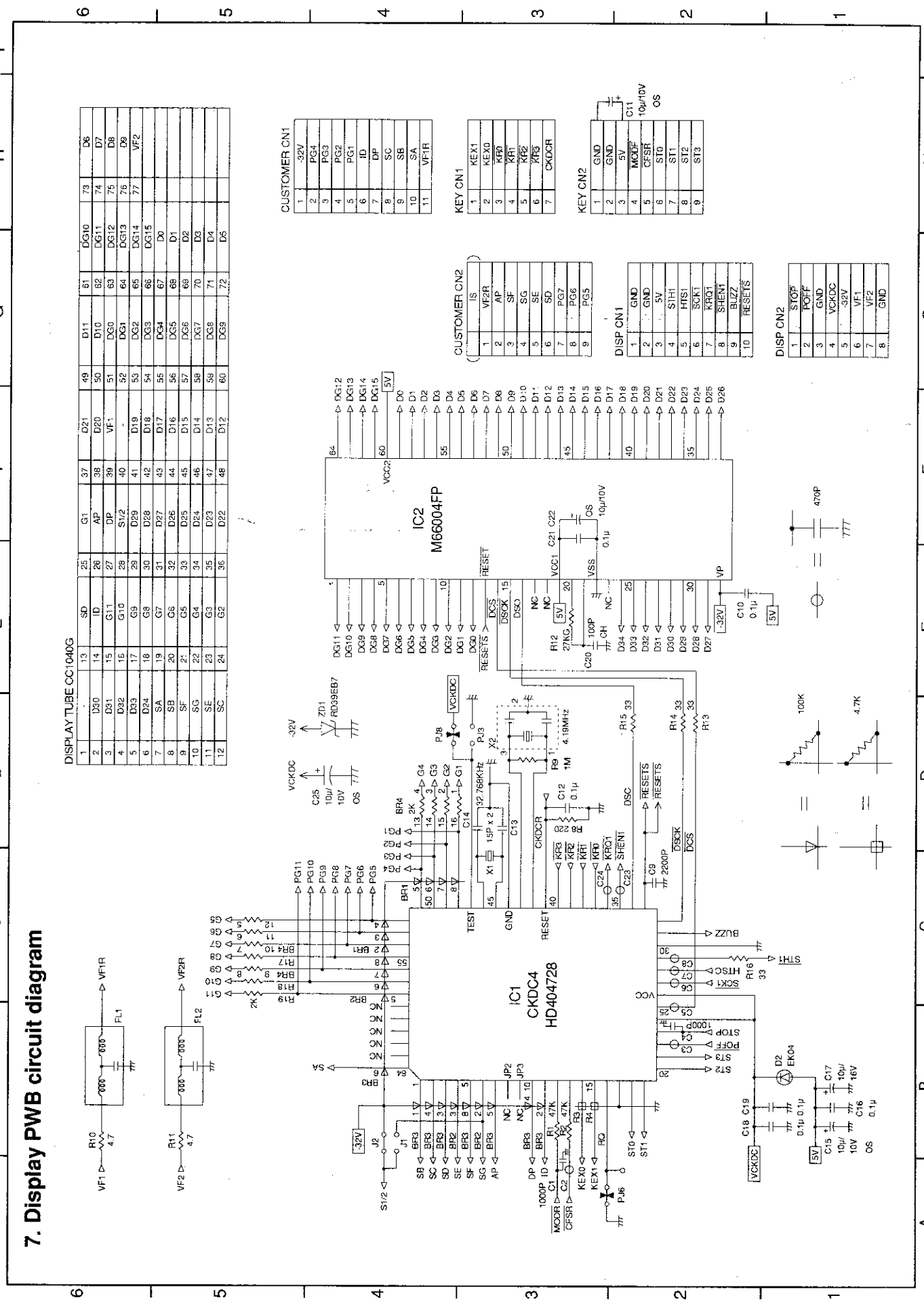
PIN	SIGNAL
1	V-
2	VC
3	GND

PIN	SIGNAL
1	VBC
2	VC

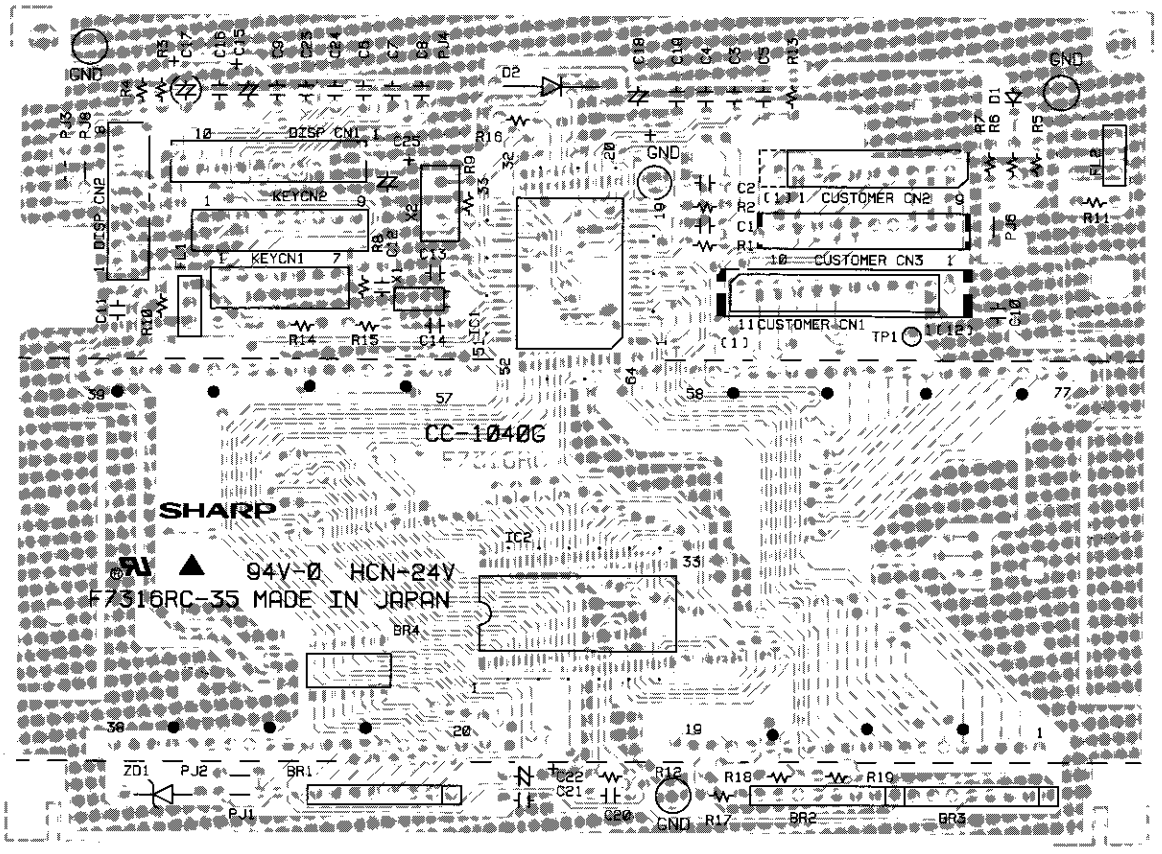
6. Power supply PWB layout



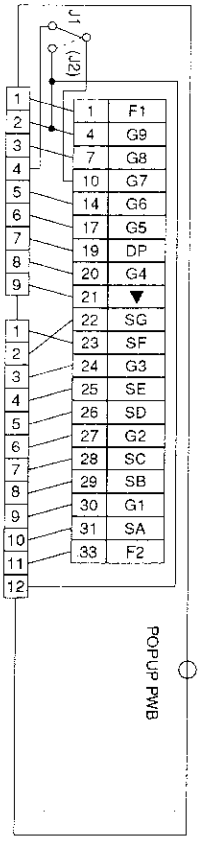
7. Display PWB circuit diagram



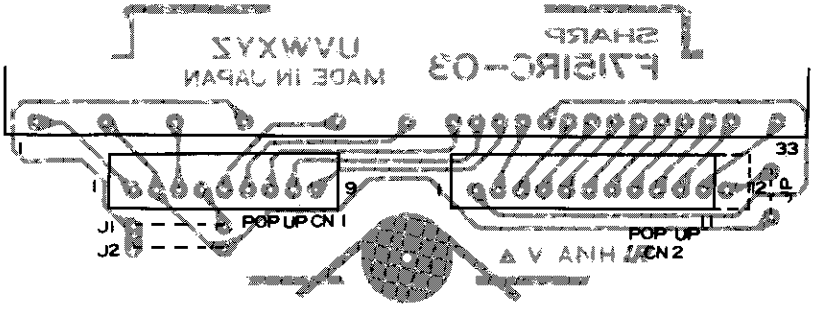
8. Display PWB layout



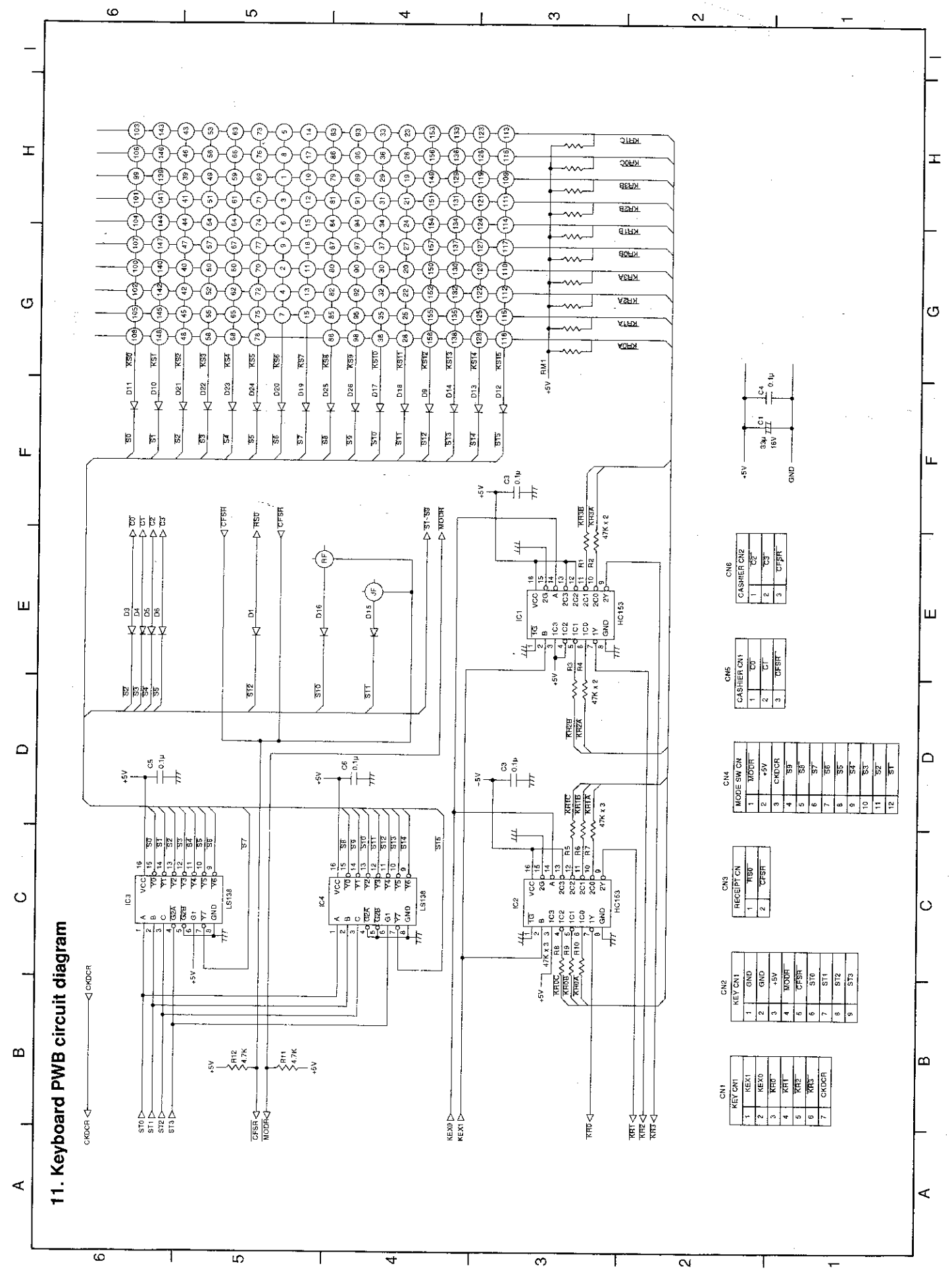
9. Pop-up display PWB circuit diagram



10. Pop-up display PWB layout



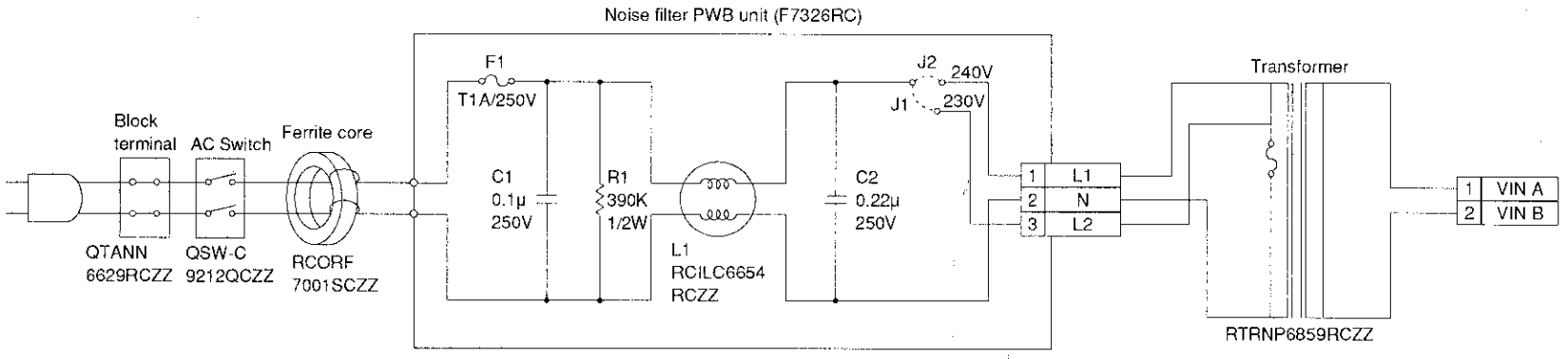
11. Keyboard PWB circuit diagram



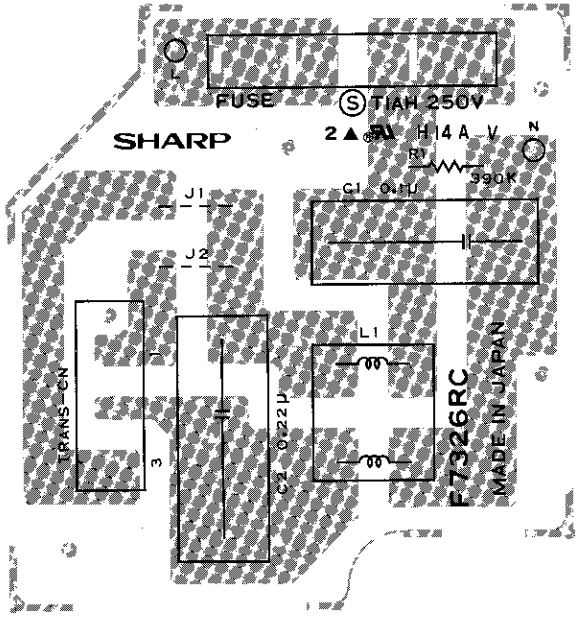
12. Keyboard position table

↑ RECEIPT	↑ JOURNAL	28	38	48	58	68	78	88	98	108	118	128	138	148	158
9	18	27	37	47	57	67	77	87	79	107	117	127	137	147	157
8	17	26	36	46	56	66	76	86	96	106	116	126	136	146	156
7	16	25	35	45	55	65	75	85	95	105	115	125	135	145	155
6	15	24	34	44	54	64	74	84	94	104	114	124	134	144	154
5	14	23	33	43	53	63	73	83	93	103	113	123	133	143	153
4	13	22	32	42	52	62	72	82	92	102	112	122	132	142	152
3	12	21	31	41	51	61	71	81	91	101	111	121	131	141	151
2	11	20	30	40	50	60	70	80	90	100	110	120	130	140	150
1	10	19	29	39	49	59	69	79	89	99	109	119	129	139	149

13. Noise filter PWB circuit diagram ⚠



14. Noise filter PWB layout



SHARP PARTS GUIDE

MODEL ER-A670

PRINTER: MT-245
(for KB, TQ, TR, TS)

CONTENTS

1 Top cabinet etc.
2 Bottom cabinet etc.
3 Packing material & Accessories
4 Main PWB unit
5 Display PWB unit
6 Power supply PWB unit
7 Noise filter PWB unit
8 Pop-up PWB unit
9 Articles for consumption
10 Service route options & Service tools
11 AC cord
■ Index

Because parts marked with "⚠" is indispensable for the machine safety maintenance and operation, it must be replaced with the parts specific to the product specification.

Table of destinations

SELECTION CODE	COUNTRIES
U	U. S. A., Guam
A	Canada
TS	Germany
TQ	SEEG territory other than Germany (Stamp : English)
TR	SEEG territory other than Germany (Stamp : Spanish)
KB	U. Kingdom
KA	Australia

SELECTION CODE	COUNTRIES
SB	Saudi Arabia (127V area)
SBA	Saudi Arabia (220V area)
SC	Taiwan
SD	Venezuela
SE	Hong Kong
SG	Lebanon, Syria, Greece, Pakistan, Iran, Egypt, Thailand, Iraq, Mauritius, Seychelles, Tahiti, Jordan, Sudan, Turkey
SH	South Africa (U. S. A. version)
SHE	South Africa (Europe version)
SJ	Philippines (Europe version)
SJ2	Philippines (U. S. A. version)
SM	Kuwait, Qatar, Oman, UAE, Malta, Bahrain
SMT	Nigeria, Yemen, Kenya

SELECTION CODE	COUNTRIES
K	Korea

SELECTION CODE	COUNTRIES
RA1	Morocco, Algeria, Tunisia, West Africa
RA2	Chile, Uruguay, Peru, Argentina, Paraguay
RA5	Sri Lanka

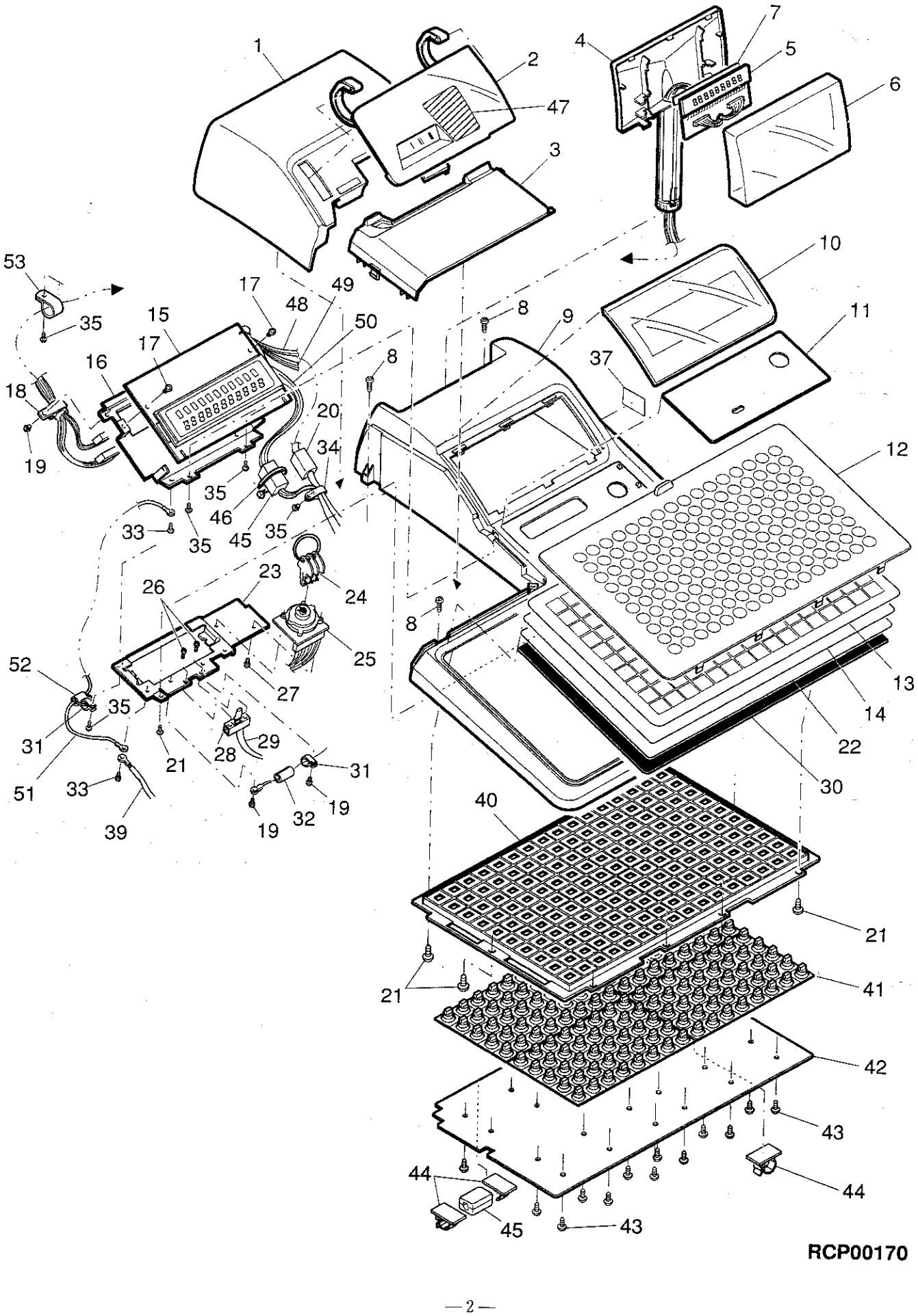
SELECTION CODE	COUNTRIES
RB3	Indonesia
RB4	
RB5	Cyprus
RB6	Panama
RB7	Barbados
RB8	Malaysia (U. S. A. version)

SELECTION CODE	COUNTRIES
RC1	Malaysia (Europe version)
RC2	Singapore
RC5	Dominican Republic, Ecuador

1 Top cabinet etc.

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	CCOVA7038RC02	AU		D	Printer cover unit (include No.2,47)
2	PFiLW6925RCZZ	AK		D	Journal filter
3	GCOVA7060RCZZ	AP	N	D	Ribbon cover
4	GCAB-7143RCZZ	AH		D	Pop-up cabinet
5	CPWBF7136RC01	BD		E	Pop-up PWB unit
6	PFiLW6923RCSD	AN	N	D	Pop-up filter
7	PSPAG6703RCZZ	AB		C	Display spacer
8	XBBSC30P06000	AA		C	Screw (3×6)
9	CCABB7141RC07	BA	N	D	Top cabinet unit (include No.10,11)
10	PFiLW6924RCSD	AM	N	D	Display filter
11	HPNLC6818RCSF	AK	N	D	Mode switch panel
12	GCOVB7041RCZZ	AY		D	Flat key cover A
13	PSHEK6796RCZZ	AK	N	C	Flat key sheet(Standard)
14	PSHEK6804RCZZ	AD	N	C	Key sheet(Programing)
15	CPWBF7316RC01	BY	N	E	Display PWB unit
16	LANGT7505RCZZ	AM	N	C	Display PWB angle
17	LX-BZ6665RCZZ	AA		C	Screw (3×6)
18	RCORF6683RCZZ	AM		C	Core
19	XHBSD30P08000	AA		C	Screw (3×8)
20	RCORF1016LCZZ	AL		C	Core (SFC-5)
21	XEBSD30P06000	AA		C	Screw (3×6)
22	PSHEK6777RCZZ	AC		C	Key sheet(blank)
23	LANGT7465RCZZ	AK		C	Switch angle
24	LKGiM7110RCZZ	AG		B	Master key (MA)
	LKGiM7111RCZZ	AG		B	Operator key (OP)
	LKGiM7129RCZZ	AE		B	Sub master key (OP key only)
25	LKGiW7256RCZZ	AP		B	Mode key switch (Body)
26	XBPSD26P04K00	AA		C	Screw (M2.6×4)
27	XUPSD23P08000	AA		C	Screw (2.3×8)
28	CSW-S6850RC01	AH		B	Slide switch unit
29	QCNW-7434RCZZ	AC		C	Harness (2pin)
30	GCOVB7042RCZZ	AW		D	Flat key cover B
31	LHLDW0024SCZZ	AA		C	Wire holder (HP-2N)
32	RCORF6654RCZZ	AH		C	Core (5-28-8-F)
33	LX-BZ6774RCZZ	AA		C	Screw (4×6S)
34	LHLDW0004SCZZ	AB		C	Wire clamp (HP-6N)
35	XEBSD30P08000	AA		C	Screw (3×8)
37	TCAUS6668RCZZ	AA		D	Caution label
39	QCNW-7120RCZZ	AE		C	Earth wire (Keyboard··Printer angle)
40	0AL101KFG-001	AV		C	Housing (101KFG-001-90R)
41	0AL421KFG-001	BB		C	Rubber sheet (421KFG-001-90R)
42	0AL9090E1002R	BK		E	Keyboard PWB ass'y
43	0ALZD2006-670	AA		C	Screw (Z-D2006-670)
44	LHLDW5034BCZZ	AB		C	Wire holder (CKN-10)
45	RCORF6662RCZZ	AK		C	Core (SFC-6)
46	LBNDJ2004SCZZ	AA		C	Wire band (PLT-1.5I)
47	PFiLW6926RCZZ	AD		D	Clear filter
48	QCNW-7599RCZZ	AK		C	Key cable 2 (9pin)
49	QCNW-7616RCZZ	AK		C	Key-display cable (7pin)
50	QCNW-7615RCZZ	AT		C	Display cable
51	QCNW-7000RC18	AC		C	Earth wire
52	RCORF6684RCZZ	AG		C	Core (TR-16-8-16M)
53	LHLDW0008SCZZ	AA		C	Cable holder
101	0ALW-P9002-01	AC		B	Connector (W-P9002#01)(2pin)
102	0ALW-P9003-01	AC		C	Connector (W-P9003#01)(3pin)
103	0ALW-P9003-50	AC		C	Connector (3pin)
104	0ALW-P5107-51	AC		C	Connector (7pin)
105	0ALW-P5109-51	AC		C	Connector (9pin)
106	0ALZZ05200138	AQ		B	IC (LS138)(Z-0520-00138)
107	0ALZY03600874	AH		B	IC (HC153)
108	RMPTC0473QCKB	AD		B	Block resistor
109	0ALZW8AA473DJ	AA		C	Resistor (47KΩ)(Z-08AA-473DJ#01)
110	0ALZV12CK104E	AD		C	Capacitor (0.1μF)(Z-V12CK104EMSR#1)
111	VHDDSS133//-1	AA		B	Diode (DSS133)
112	VRD-HT2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)
113	VCEAGU1CW336M	AA		C	Capacitor (16WV 33μF)
501	DUNTK9161RCZZ	BL		E	Keyboard unit(flat type) [Include No.40~43,101~113]

1 Top cabinet etc.

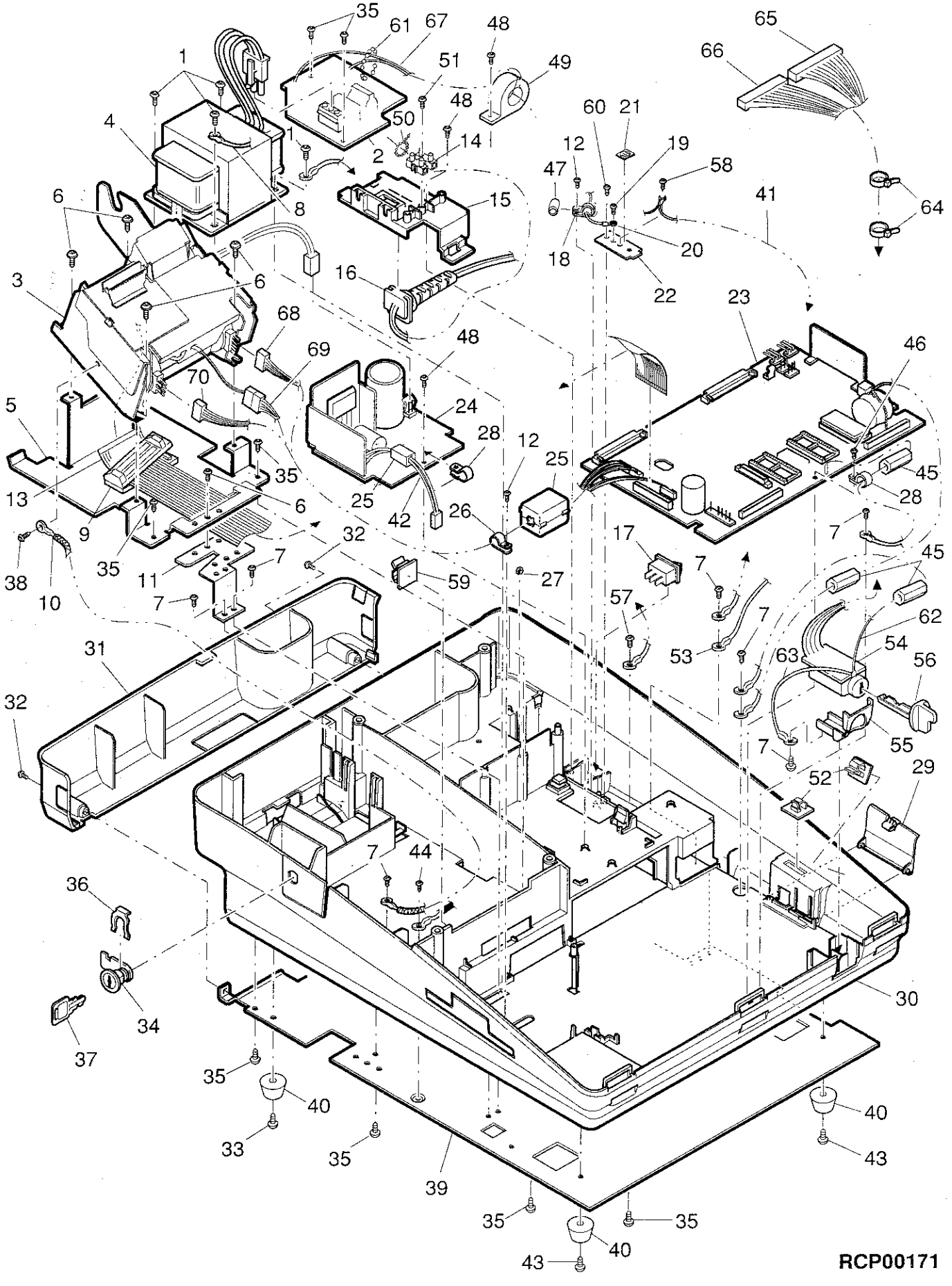


RCP00170

2 Bottom cabinet etc.

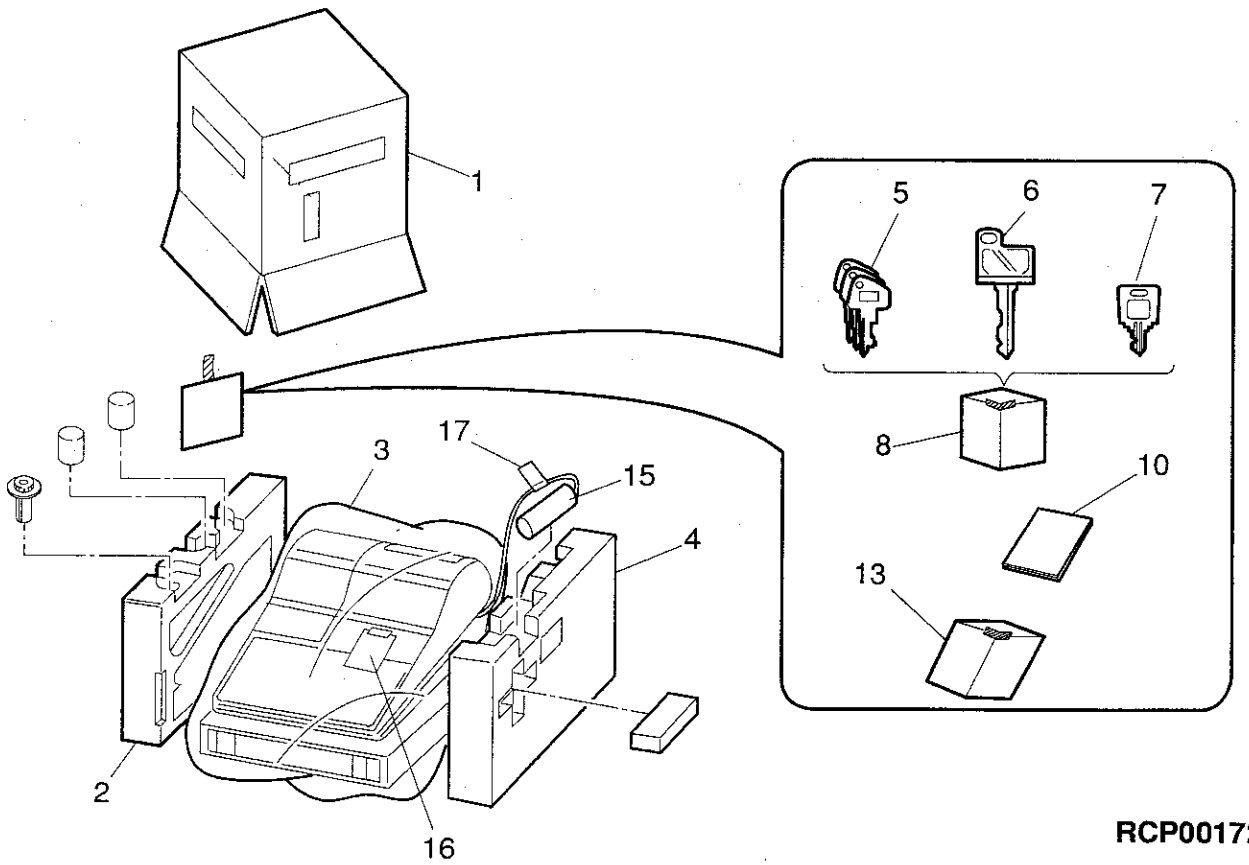
NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	XUBSD40P08000	AA		C	Screw (4×8)	
2	CPWBF7326RC01	BB	N	E	Noise filter PWB unit	[TQ,TR,TS]
	CPWBF7326RC02	BB	N	E	Noise filter PWB unit	[KB]
3	Ki−ŌB6765RCZZ	CK	N	E	Printer unit (MT−245)	
⚠ 4	RTRNP6859RCZZ	BG		B	Power transformer	
5	LANGT7501RCZZ	AP	N	C	Printer angle	
6	LX−BZ6665RCZZ	AA		C	Screw (3×6)	
7	LX−BZ6774RCZZ	AA		C	Screw (4×6S)	
8	QCNW−7641RCZZ	AD	N	C	GND wire 2	
9	RCŌRF6689RCZZ	AZ	N	C	Core (BCN−40)	
10	QCNW−7121RCZZ	AD		C	Earth wire (Printer↔Base plate)	
11	LANGQ7476RCZZ	AF		C	Printer eath angle	
12	XEBSD30P08000	AA		C	Screw (3×8)	[KB]
13	QCNW−7620RCZZ	AN	N	C	Lead wire	
14	QTANN6629RCZZ	AF		C	Block terminal (TYP500)	
15	LHLDK6813RCSA	AE		C	PS holder	
⚠	QACCE3120QCN5	AL		B	AC cord (250V 2.5A)	[TQ,TR,TS]
⚠ 16	QCNW−7212RCZZ	AH		B	BS ordiary cable	[KB]
⚠	QPLGA0006QCZZ	AQ		C	Plug (3A 250V)	[KB]
⚠ 17	QSW−C9212QCZZ	AH		B	Seesaw switch	
18	LHLDW0007SCZZ	AA		C	Wire holder (HP−7N)	[KB]
19	XBPBZ40P06K00	AA		C	Screw (4×6K)	[KB]
20	QTANP0004HCZZ	AB		C	Lug terminal (4φ)	[KB]
21	TLAB−4681CCZZ	AA		D	Earth mark label	[KB]
22	LANGQ7472RCZZ	AE		C	Main earth angle	[KB]
23	CPWBX7315RC01	CN	N	E	Main PWB unit	
24	CPWBF7289RC06	BL	N	E	Power supply PWB unit	
25	RCŌRF6662RCZZ	AK		C	Core (SFC−6)	
26	LHLDW0001SCZZ	AA		C	Clamp holder	
27	XNESD30−24000	AA		C	Nut (3NS)	
28	LHLDW0024SCZZ	AA		C	Wire holder (HP−2N)	
29	GFTAS6769RCSA	AC		D	SIO connecter lid	
30	GCABA7142RCSD	BD	N	D	Bottom cabinet	
31	GCŌVA7040RCSA	AQ		D	Rear cover	
32	XBBSC30P20000	AA		C	Screw (3×20)	
33	XCPSD30P12X00	AA		C	Screw (3×12X)	
34	LKGiW2363RCZZ	AL		B	Lock key (body)	
35	XEBSD30P06000	AA		C	Screw (3×6)	
36	MSPRK6660RCZZ	AC		C	Lock spring	
37	LKGiM6784RCZZ	AD		B	Printer cover key (1PC)	
38	XHPSD40P08KS0	AA		C	Screw (4×8KS)	
39	LCHSM6692RCZZ	AV		C	Main chassis	
40	GLEGG6653RCZZ	AD		D	Rubber foot	
41	QCNW−7592RCZZ	AD		C	Earth wire G/Y	[KB]
42	QCNW−7575RCZZ	AE		C	PS cable (2pin)	
43	LX−BZ6754RCZZ	AA		C	Screw	
44	XBPSD30P06KS0	AA		C	Screw (3×6KS)	
45	RCŌRF6661RCZZ	AK		C	Core (SFC−4)	
46	XUBSD30P10000	AC		C	Screw (3×10)	
⚠ 47	RCŌRF6682RCZZ	AE		C	Core	[KB]
48	XEBSD30P08000	AA		C	Screw (3×8)	
⚠ 49	RCŌRF7001SCZZ	AL		C	Core (ESD−R−25DR)	
50	LBNDJ0004UCZZ	AA		C	Band	
51	XUPSD30P16000	AA		C	Screw (3×16)	
52	LHLDW2341RCZZ	AB		C	Cable clamp (CKN−05)	
53	QCNW−7590RCZZ	AC		C	Earth wire	[TQ,TR,TS]
54	LKGiW7339RCZZ	BB		B	Clerk key(body)	
55	HDECB6828RCZZ	AG		C	Clerk deco. panel	
56	LKGiM7340RCZZ	AX		B	Clerk key 1(with cap)	
	LKGiM7341RCZZ	AX		B	Clerk key 2(with cap)	
	LKGiM7342RCZZ	AX		B	Clerk key 3(with cap)	
	LKGiM7343RCZZ	AX		B	Clerk key 4(with cap)	
	LKGiM7344RCZZ	AX		B	Clerk key 5(with cap)	
	LKGiM7345RCZZ	AX		B	Clerk key 6(with cap)	
57	LX−BZ6665RCZZ	AA		C	Screw (3×6)	[KB]
58	LX−BZ6774RCZZ	AA		C	Screw (4×6S)	[KB]
59	LHLDW5034BCZZ	AB		C	Wire holder (CKN−10)	
60	XEBSD30P06000	AA		C	Screw (3×6)	[KB]
61	LBNDJ0004UCZZ	AA		C	Band	[KB]
62	QCNW−7642RCZZ	AC	N	C	GND wire 3	
63	QCNW−7644RCZZ	AB	N	C	Earth wire 4	
64	LBNDJ0013FCZZ	AA		C	Band	
65	QCNW−7062RCZZ	AQ		C	Connector cable (3P)	
66	QCNW−7063RCZZ	AQ		C	Connector cable (2P)	
67	QCNW−7623RCZZ	AF	N	C	N/F cable	[KB]
68	QCNW−7618RCZZ	AK	N	C	Harness	
69	QCNW−7619RCZZ	AK	N	C	Harness	
70	QCNW−7617RCZZ	AK	N	C	Harness	

2 Bottom cabinet etc.



3 Packing material & Accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	SPAKC8218RCZZ	AU	N	D	Packing case
2	SPAKA8216RCZZ	AQ	N	D	Packing cushion(Right)
3	SPAKP5169SCZZ	AE		D	Vinyl bag
4	SPAKA8217RCZZ	AQ	N	D	Packing cushion(Left)
5	LKGiM7110RCZZ	AG		B	Master key (MA)
	LKGiM7111RCZZ	AG		B	Operator key (OP)
	LKGiM7129RCZZ	AE		B	Sub master key (OP key only)
6	LKGiM7340RCZZ	AX		B	Clerk key 1(with cap)
	LKGiM7341RCZZ	AX		B	Clerk key 2(with cap)
	LKGiM7342RCZZ	AX		B	Clerk key 3(with cap)
	LKGiM7343RCZZ	AX		B	Clerk key 4(with cap)
	LKGiM7344RCZZ	AX		B	Clerk key 5(with cap)
	LKGiM7345RCZZ	AX		B	Clerk key 6(with cap)
7	LKGiM6784RCZZ	AD		B	Printer cover key (1PC)
8	SSAKA1221QCZZ	AA		D	Vinyl bag (150×250mm)
10	TiNSE7265RCZZ	AY	N	D	Instruction book
	TiNSF7266RCZZ	AY	N	D	Instruction book [TQ,TR,TS]
	TiNSG7267RCZZ	AY	N	D	Instruction book [TQ,TR,TS]
	TiNSS7268RCZZ	AY	N	D	Instruction book [TQ,TR,TS]
13	SSAKH3015CCZZ	AA		D	Vinyl bag (200×300mm)
15	SSAKH4231CCZZ	AA		D	Vinyl bag (140×500mm)
16	TCADH6654RCZZ	AB		D	Caution card
17	TCAUS1054CCZZ	AB		D	Caution TAG [KB]
101	UBNDA1008CCZZ	AA		C	AC cord band (120mm)



RCP00172

4 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	UBATN2183CCZZ	AV		B	Battery (151FT 3CELL)	[BT2]
2	RALMB6640RCZZ	AF		B	Buzzer (SMX06)	[BZ1]
3	VCEAGA1CW106M	AA		C	Capacitor (16WV 10μF)	[C1]
4	RC-EZ107BRC1A	AH		C	Capacitor (10WV 100μF)	[C2]
5	RC-EZ106ARC1A	AD		C	Capacitor (10WV 10μF)	[C3]
6	RC-EZ106ARC1C	AD		C	Capacitor (16WV 10μF)	[C4]
7	VCEAGA1CW106M	AA		C	Capacitor (16WV 10μF)	[C5]
8	VCEA2U1HW228M	AH	N	C	Capacitor (50WV 2200μF)	[C14]
9	RC-EZ106ARC1A	AD		C	Capacitor (10WV 10μF)	[C15]
10	VCEAGA1CW106M	AA		C	Capacitor (16WV 10μF)	[C16]
11	RC-EZ106ARC1A	AD		C	Capacitor (10WV 10μF)	[C17]
12	VCEAGA1HW106M	AA		C	Capacitor (50WV 10μF)	[C18]
13	RC-EZ106ARC1A	AD		C	Capacitor (10WV 10μF)	[C19]
14	VCQYNU1HM683K	AB		C	Capacitor (50WV 0.068μF)	[C20]
15	VCEAGU2AW226M	AB		C	Capacitor (100WV 22μF)	[C21]
16	VCEAGA1CW106M	AA		C	Capacitor (16WV 10μF)	[C22]
17	RC-EZ106ARC1A	AD		C	Capacitor (10WV 10μF)	[C23]
18	RC-EZ476ARC1A	AF		C	Capacitor (10WV 47μF)	[C24]
19	VCEAGU1HW227M	AC		C	Capacitor (50WV 220μF)	[C26]
20	VCEAGU1HW477M	AD		C	Capacitor (50WV 470μF)	[C27]
21	VCEAGA1CW106M	AA		C	Capacitor (16WV 10μF)	[C28]
22	RC-EZ476ARC1A	AF		C	Capacitor (10WV 47μF)	[C29]
23	VCEAGU1CW108M	AD		C	Capacitor (16WV 1000μF)	[C30]
24	VCEAGA1HW105M	AB		C	Capacitor (50WV 1μF)	[C31]
25	VCEAGA1CW106M	AA		C	Capacitor (16WV 10μF)	[C32]
26	VCEAGA1CW106M	AA		C	Capacitor (16WV 10μF)	[C33]
27	RC-EZ106ARC1A	AD		C	Capacitor (10WV 10μF)	[C34]
28	RC-EZ476ARC1A	AF		C	Capacitor (10WV 47μF)	[C35]
29	RC-EZ476ARC1A	AF		C	Capacitor (10WV 47μF)	[C36]
30	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C100]
31	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C101]
32	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C102]
33	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C103]
34	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C104]
35	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C105]
36	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C106]
37	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C108]
38	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C109]
39	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C110]
40	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C111]
41	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C112]
42	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C113]
43	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C114]
44	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C115]
45	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C116]
46	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C117]
47	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C118]
48	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C119]
49	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C120]
50	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C123]
51	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C124]
52	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C125]
53	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C126]
54	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C127]
55	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C128]
56	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C129]
57	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C130]
58	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C131]
59	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C132]
60	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C133]
61	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C134]
62	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C135]
63	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C136]
64	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C137]
65	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C138]
66	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C139]
67	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C140]
68	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C141]
69	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C142]
70	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C143]
71	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C144]
72	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C146]
73	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C147]
74	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C148]
75	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C149]
76	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C150]
77	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C151]
78	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C152]
79	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C153]
80	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C154]

4 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
81	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C156]
82	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C157]
83	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C158]
84	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C160]
85	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C161]
86	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C162]
87	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C163]
88	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C164]
89	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C165]
90	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C166]
91	VCKYTV1HB103K	AB		C	Capacitor (50WV 0.010μF)	[C167]
92	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C168]
93	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C169]
94	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C170]
95	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C171]
96	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C172]
97	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C174]
98	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C175]
99	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C177]
100	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C178]
101	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C179]
102	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C180]
103	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C181]
104	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C182]
105	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C183]
106	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C184]
107	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C185]
108	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C186]
109	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C187]
110	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C189]
111	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C192]
112	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C193]
113	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C194]
114	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C195]
115	VCKYTV1HB152K	AA		C	Capacitor (50WV 1500PF)	[C196]
116	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C197]
117	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C198]
118	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C199]
119	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C200]
120	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C201]
121	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C202]
122	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C203]
123	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C204]
124	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C205]
125	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C206]
126	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C207]
127	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C208]
128	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C209]
129	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C210]
130	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C211]
131	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C212]
132	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C213]
133	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C214]
134	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C215]
135	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C216]
136	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C217]
137	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C218]
138	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C219]
139	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C220]
140	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C221]
141	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C222]
142	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C223]
143	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C224]
144	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C225]
145	VCCCTV1HH221J	AA		C	Capacitor (50WV 220PF)	[C226]
146	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C227]
147	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C228]
148	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C229]
149	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C230]
150	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C231]
151	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C232]
152	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C233]
153	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C234]
154	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C235]
155	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C236]
156	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C237]
157	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C238]
158	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C239]
159	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C240]
160	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C241]

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NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
161	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C242]
162	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C243]
163	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C244]
164	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C245]
165	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C246]
166	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C247]
167	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C248]
168	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C249]
169	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C250]
170	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C251]
171	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C252]
172	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C253]
173	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C254]
174	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C255]
175	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C256]
176	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C259]
177	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C260]
178	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C261]
179	VCKYTV1HB103K	AB		C	Capacitor (50WV 0.010μF)	[C262]
180	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C263]
181	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C264]
182	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C265]
183	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C266]
184	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C267]
185	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C268]
186	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C269]
187	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C270]
188	VCCCTV1HH470J	AA		C	Capacitor (50WV 47PF)	[C271]
189	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C273]
190	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C276]
191	VCCCTV1HH331J	AA		C	Capacitor (50WV 330PF)	[C277]
192	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C280]
193	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C281]
194	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C282]
195	QCNW-7619RCZZ	AK	N	C	Harness	[CUTCN]
196	VHD1SS353//-1	AB	N	B	Diode (1SS353)	[D100]
197	VHDSFPB54//-1	AC		B	Diode (SFPB54)	[D101]
198	VHDSFPB54//-1	AC		B	Diode (SFPB54)	[D102]
199	VHD1SS353//-1	AB	N	B	Diode (1SS353)	[D103]
200	VHD1SS353//-1	AB	N	B	Diode (1SS353)	[D104]
201	VHDSFPL52V//-1	AC		B	Diode (SFPL52V)	[D109]
202	VHDSFPL52V//-1	AC		B	Diode (SFPL52V)	[D110]
203	VHD1SS353//-1	AB	N	B	Diode (1SS353)	[D111]
204	VHDSFPL52V//-1	AC		B	Diode (SFPL52V)	[D112]
205	VHD1SS353//-1	AB	N	B	Diode (1SS353)	[D113]
206	VHD1SS353//-1	AB	N	B	Diode (1SS353)	[D114]
207	VHD1SS353//-1	AB	N	B	Diode (1SS353)	[D115]
208	VHDSFPB54//-1	AC		B	Diode (SFPB54)	[D116]
209	VHD1SS353//-1	AB	N	B	Diode (1SS353)	[D117]
210	VHD1SS353//-1	AB	N	B	Diode (1SS353)	[D118]
211	VHD1SS353//-1	AB	N	B	Diode (1SS353)	[D119]
212	VHD1SS353//-1	AB	N	B	Diode (1SS353)	[D120]
213	VHD1SS353//-1	AB	N	B	Diode (1SS353)	[D121]
214	QCNCM6926RC1H	AE		C	Connector (18pin)	[DISPCN]
215	QCNCM5278NCZZ	AC		C	Connector	[DRCN1]
216	QCNCM5278NCZZ	AC		C	Connector	[DRCN2]
217	QCNCM6699RCZZ	AC		B	Connector (3pin)	[DRSP3]
218	QCNCM6699RCZZ	AC		B	Connector (3pin)	[DRSP4]
⚠ 219	QFS-A1037CCZZ	AC		A	Fuse (1.5A)(MINI TYPE)	[F1]
220	QFSHA1002CCZZ	AB		C	Fuse holder (MINI TYPE)	[F1]
⚠ 221	QFS-C4081CCZZ	AF		A	Fuse (250V 2.5A)	[F2]
222	QFSHA1002CCZZ	AB		C	Fuse holder (MINI TYPE)	[F2]
223	RCORF6674RCZZ	AB		C	Beads core (SA39)	[FB1]
224	RCiLZ1003LCZZ	AB		C	Coil (FLDR25C)	[FB2]
225	RCiLZ1003LCZZ	AB		C	Coil (FLDR25C)	[FB3]
226	RCiLZ1003LCZZ	AB		C	Coil (FLDR25C)	[FB4]
227	RCiLZ1003LCZZ	AB		C	Coil (FLDR25C)	[FB7]
228	RCiLZ1003LCZZ	AB		C	Coil (FLDR25C)	[FB8]
229	RCiLZ1003LCZZ	AB		C	Coil (FLDR25C)	[FB9]
230	RCiLZ1003LCZZ	AB		C	Coil (FLDR25C)	[FB10]
231	RCiLZ1003LCZZ	AB		C	Coil (FLDR25C)	[FB11]
232	RCiLZ1003LCZZ	AB		C	Coil (FLDR25C)	[FB13]
233	RCiLZ1003LCZZ	AB		C	Coil (FLDR25C)	[FB14]
234	RCORF6673RCZZ	AB		C	Core (DR35C)	[FB15]
235	RCiLZ1003LCZZ	AB		C	Coil (FLDR25C)	[FB16]
236	RCiLZ1003LCZZ	AB		C	Coil (FLDR25C)	[FB17]
237	RCiLZ1003LCZZ	AB		C	Coil (FLDR25C)	[FB18]
238	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)	[FB100]
239	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)	[FB101]
240	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)	[FB102]

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NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
241	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)	[FB103]
242	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)	[FB104]
243	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)	[FB105]
244	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)	[FB106]
245	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)	[FB107]
246	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)	[FB108]
247	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)	[FB109]
248	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)	[FB110]
249	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)	[FB111]
250	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)	[FB112]
251	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)	[FB113]
252	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)	[FB114]
253	RCiLZ5017SCZZ	AB		C	Coil (BLM31A02)	[FB115]
254	RFiLN6014RCZZ	AC		C	Filter (DNF331I)	[FL1]
255	RFiLN6014RCZZ	AC		C	Filter (DNF331I)	[FL2]
256	RFiLN6014RCZZ	AC		C	Filter (DNF331I)	[FL3]
257	RFiLN6014RCZZ	AC		C	Filter (DNF331I)	[FL4]
258	RFiLN6014RCZZ	AC		C	Filter (DNF331I)	[FL5]
259	RFiLN6014RCZZ	AC		C	Filter (DNF331I)	[FL6]
260	RFiLN6014RCZZ	AC		C	Filter (DNF331I)	[FL7]
261	RFiLN6014RCZZ	AC		C	Filter (DNF331I)	[FL8]
262	VHiSN74HC00NS	AC		B	IC (SN74HC00NS)	[IC1]
263	VHiiR9431N/-1	AG		B	IC (IR9431N)	[IC3]
264	VHiTD62503F-1	AF		B	IC (TD62503F)	[IC7]
265	VHiiR9393N/-1	AD		B	IC (IR9393N)	[IC8]
266	VHiiR9393N/-1	AD		B	IC (IR9393N)	[IC9]
267	VHiHM128F12SL	BN		B	IC (HM128F12SL)	[IC10]
268	VHiSN74HC08NS	AD		B	IC (SN74HC08NS)	[IC15]
269	QSOCZ2042SC32	AE		C	IC socket (32pin)	[IC16]
270	VHi27040RAA1A	BS	N	B	IC (27040RAA1A)	[IC16]
271	QSOCZ2042SC32	AE		C	IC socket (32pin)	[IC17]
272	QSOCZ2042SC32	AE		C	IC socket (32pin)	[IC18]
273	VHiTA8428K/-1	AN		B	IC (TA8428K)	[IC19]
274	VHiF258016PC/	AZ		B	IC (F258016PC)	[IC20]
275	VHiMB8464R7LF	AU	N	B	IC (MB8464R7LF)	[IC22]
276	VHiiR9393N/-1	AD		B	IC (IR9393N)	[IC23]
277	VHiF258024PC/	AZ	N	B	IC (F258024PC)	[IC24]
278	VHiSTA401A/-1	AP		B	IC (STA401A)	[IC25]
279	VHiMC34063AM1	AG		B	IC (MC34063AM1)	[IC27]
280	VHiH641510810	BA	N	B	IC (H641510810)	[IC28]
281	VHiTD62308F-1	AH		B	IC (TD62308F)	[IC29]
282	VHiSN74HC14NS	AE		B	IC (SN74HC14NS)	[IC30]
283	VHiSTA401A/-1	AP		B	IC (STA401A)	[IC31]
284	QCNW-7618RCZZ	AK	N	C	Harness	[JPFCN]
285	RCiLC6633RCTZ	AH		C	Coil (CR-20)	[L2]
286	QCNCM7071RC6H	AN	N	C	Connector (68pin)	[OPTCN1]
287	QCNCM7071RC6H	AN	N	C	Connector (68pin)	[OPTCN2]
288	QCNCM1101CCZZ	AB		C	Connector (2pin)	[PSCN]
289	VS2SJ177///-1	AP	N	B	Transistor (2SJ177)	[Q1]
290	VS2SJ263///-1	AM	N	B	Transistor (2SJ263)	[Q3]
291	VS2SC4153-/-1	AG		B	Transistor (2SC4153)	[Q4]
292	VS2SC4153-/-1	AG		B	Transistor (2SC4153)	[Q5]
293	VS2SA1036KQRC	AB		B	Transistor (2SA1036KQRC)	[Q100]
294	VS2SC2412K/-1	AB		B	Transistor (2SC2412K)	[Q102]
295	VS2SD1898//-1	AD	N	B	Transistor (2SD1898)	[Q103]
296	VS2SC2412K/-1	AB		B	Transistor (2SC2412K)	[Q104]
297	VS2SA1036KQRC	AB		B	Transistor (2SA1036KQRC)	[Q105]
298	VRD-RB2HY561J	AA		C	Resistor (1/2W 560Ω ±5%)	[R1]
299	RR-XZ8R2FRC3A	AC	N	B	Fuse resistor (1W 82Ω)	[R4]
300	VRD-RC2EY392G	AA		C	Resistor (1/4W 3.9KΩ ±2%)	[R6]
301	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R100]
302	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R101]
303	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R102]
304	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R103]
305	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R104]
306	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R106]
307	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R108]
308	VRS-TS2AD562J	AA		C	Resistor (1/10W 5.6KΩ ±5%)	[R109]
309	VRS-TS2AD391J	AA		C	Resistor (1/10W 390Ω ±5%)	[R110]
310	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R117]
311	VRS-TS2AD241J	AA		C	Resistor (1/10W 240Ω ±5%)	[R119]
312	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R123]
313	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R125]
314	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R127]
315	VRS-TS2AD680F	AA	N	C	Resistor (1/10W 68Ω ±1%)	[R128]
316	VRSTS2AD1151F	AA		C	Resistor (1/10W 150Ω ±1%)	[R129]
317	VRSTS2AD1330F	AA	N	C	Resistor (1/10W 33Ω ±1%)	[R130]
318	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R131]
319	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R132]
320	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R133]

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NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
321	VRS-TS2AD332J	AA		C	Resistor (1/10W 3.3KΩ ±5%)	[R136]
322	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R137]
323	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R140]
324	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R141]
325	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R144]
326	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R145]
327	VRS-TS2AD183F	AA		C	Resistor (1/10W 18KΩ ±1%)	[R146]
328	VRS-TS2AD332J	AA		C	Resistor (1/10W 3.3KΩ ±5%)	[R148]
329	VRS-TS2AD562J	AA		C	Resistor (1/10W 5.6KΩ ±5%)	[R149]
330	VRS-TS2AD682J	AA		C	Resistor (1/10W 6.8KΩ ±5%)	[R152]
331	VRS-TS2AD562J	AA		C	Resistor (1/10W 5.6KΩ ±5%)	[R153]
332	VRS-TS2AD2R2J	AA	N	C	Resistor (1/10W 2.2Ω ±5%)	[R154]
333	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R155]
334	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R156]
335	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R157]
336	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R158]
337	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R159]
338	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R161]
339	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R162]
340	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R163]
341	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R164]
342	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R165]
343	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R166]
344	VRS-TS2AD220J	AA		C	Resistor (1/10W 22Ω ±5%)	[R167]
345	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R168]
346	VRS-TS2AD682J	AA		C	Resistor (1/10W 6.8KΩ ±5%)	[R169]
347	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R170]
348	VRS-TS2AD104J	AA		C	Resistor (1/10W 100KΩ ±5%)	[R171]
349	VRS-TS2AD104J	AA		C	Resistor (1/10W 100KΩ ±5%)	[R172]
350	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R174]
351	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R175]
352	VRS-TS2AD273J	AA		C	Resistor (1/10W 27KΩ ±5%)	[R177]
353	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R178]
354	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R179]
355	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R181]
356	VRS-TS2AD104J	AA		C	Resistor (1/10W 100KΩ ±5%)	[R184]
357	VRS-TS2AD272F	AA	N	C	Resistor (1/10W 2.7KΩ ±1%)	[R186]
358	VRS-TS2AD563J	AA		C	Resistor (1/10W 56KΩ ±5%)	[R187]
359	VRS-TS2AD563J	AA		C	Resistor (1/10W 56KΩ ±5%)	[R188]
360	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R189]
361	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R190]
362	VRS-TS2AD273J	AA		C	Resistor (1/10W 27KΩ ±5%)	[R191]
363	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R198]
364	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R199]
365	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R200]
366	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R201]
367	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R202]
368	VRS-TS2AD182G	AA	N	C	Resistor (1/10W 1.8KΩ ±2%)	[R203]
369	VRS-TS2AD102G	AA	N	C	Resistor (1/10W 1.0KΩ ±2%)	[R204]
370	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R205]
371	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R206]
372	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R208]
373	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R209]
374	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R210]
375	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R211]
376	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R212]
377	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R213]
378	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R214]
379	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R215]
380	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R216]
381	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R217]
382	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R218]
383	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R219]
384	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R220]
385	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R221]
386	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R222]
387	VRS-TS2AD100J	AA		C	Resistor (1/10W 10Ω ±5%)	[R224]
388	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R225]
389	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R227]
390	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R228]
391	RCŌRF1008ACZZ	AB		C	Core (BLM21A05)	[R229]
392	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R230]
393	RCŌRF1008ACZZ	AB		C	Core (BLM21A05)	[R231]
394	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R232]
395	VRS-TS2AD362F	AA		C	Resistor (1/10W 3.6KΩ ±1%)	[R233]
396	VRS-TS2AD122F	AA		C	Resistor (1/10W 1.2KΩ ±1%)	[R234]
397	VRS-TS2AD472G	AA		C	Resistor (1/10W 4.7KΩ ±2%)	[R235]
398	VRS-TS2AD912G	AA		C	Resistor (1/10W 9.1KΩ ±2%)	[R236]
399	VRS-TS2AD103F	AA		C	Resistor (1/10W 10KΩ ±1%)	[R237]
400	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R238]

4 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
401	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R240]
402	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R241]
403	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R242]
404	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R243]
405	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R244]
406	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R245]
407	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R246]
408	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R247]
409	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R248]
410	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R249]
411	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R250]
412	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R251]
413	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R252]
414	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R253]
415	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R254]
416	RCORF1008ACZZ	AB		C	Core (BLM21A05)	[R255]
417	VRS-TS2AD362F	AA		C	Resistor (1/10W 3.6KΩ ±1%)	[R256]
418	VRS-TS2AD163F	AA		C	Resistor (1/10W 16KΩ ±1%)	[R257]
419	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R258]
420	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R259]
421	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R260]
422	VRS-TS2AD473J	AA		C	Resistor (1/10W 47KΩ ±5%)	[R261]
423	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R262]
424	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R263]
425	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R265]
426	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R266]
427	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R267]
428	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R268]
429	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R269]
430	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R270]
431	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R271]
432	VRS-TS2AD622J	AA		C	Resistor (1/10W 6.2KΩ ±5%)	[R272]
433	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R279]
434	VRS-TS2AD102J	AA		C	Resistor (1/10W 1KΩ ±5%)	[R280]
435	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R281]
436	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R283]
437	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R284]
438	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R285]
439	VRS-TS2AD203J	AA		C	Resistor (1/10W 20KΩ ±5%)	[R288]
440	VRS-TS2AD330J	AA		C	Resistor (1/10W 33Ω ±5%)	[R289]
441	VRS-TS2AD221J	AA		C	Resistor (1/10W 220Ω ±5%)	[R290]
442	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA1]
443	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA2]
444	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA3]
445	RMPTC6103QCKB	AC		B	Block resistor (10KΩ×6 1/8W ±10%)	[RA4]
446	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA5]
447	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA6]
448	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA7]
449	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA8]
450	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA9]
451	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA10]
452	QCNCW7086RC5J	AK	N	C	Connector (50pin)	[RAMCN]
453	QCNW-7617RCZZ	AK	N	C	Harness	[RPFCN]
454	VHSDRA2TE//-1	AG	N	B	Thyristor (DRA2TE)	[SD1]
455	QCNCW1084ACZZ	AG		C	Connector (9pin)	[SIOCN]
456	QCNCM6865RC2J	AD		C	Connector (20pin)	[SLIPCN1]
457	QCNCM2379RC0E	AC		C	Connector (5pin)	[SLIPCN2]
458	QCNCM1060AC03	AB		C	Connector (3pin)	[SW2]
459	QCNCW1057ACZZ	AB		C	Connector (Short socket)	[SW2]
460	RTRNH6783RCZZ	AN		B	Converter transformer	[T1]
461	QCNCW7079RC3B	AF	N	C	Connector (32pin)	[TPRCN1]
462	RCRSP6664RCZZ	AF	N	B	Crystal (19.66MHz)	[X1]
463	VHERD6.2MB1-1	AC	N	B	Zener diode (RD6.2MB1)	[ZD101]
464	VHERD4.3MB1-1	AD	N	B	Zener diode (RD4.3MB1)	[ZD103]
465	VHERD5.6PB/-1	AC	N	B	Zener diode (RD5.6PB)	[ZD104]
466	LBNDJ0004UCZZ	AA		C	Band	
467	LX-BZ6665RCZZ	AA		C	Screw (3×6)	
468	PRDAF6650RCZB	AG	N	C	Heat sink	
469	QCNW-7124RCZZ	AB		C	GND wire 2 (To switch angle)	
470	VCTYPU1EX104M	AB		C	Capacitor (25WV 0.1μF)	
471	XBSSD30P08000	AA		C	Screw (3×8)	
472	XNESD30-24000	AA		C	Nut (3NS)	
	(Unit)					
901	CPWBX7315RC01	CN	N	E	Main PWB unit	

5 Display PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	PSPAG6723RCZZ	AF	N	C	Display spacer	
2	QCNCM6865RC0i	AC		C	Connector (9pin)	
3	QCNCM6865RC1A	AD		C	Connector (11pin)	
4	QCNW-7599RCZZ	AK		C	Key cable 2 (9pin)	[KEY CN2]
5	QCNW-7615RCZZ	AT		C	Display cable	
6	QCNW-7616RCZZ	AK		C	Key-display cable (7pin)	[KEY CN1]
7	RC-EZ106ARC1A	AD		C	Capacitor (10WV 10μF)	[C11,15,22,25]
8	RC-KZ1054CCZZ	AB		C	Capacitor (50WV 0.1μF)	
9	RCORF2029SCZZ	AC		C	Core	
10	RCRSP6658RCZZ	AE		B	Crystal (32.768KHz)	[X1]
11	RCRSZ6644RCZZ	AD		B	Crystal (4.19MHz)	[X2]
12	RMPTC7104QCKB	AC		B	Block Resistor (100KΩ×7 1/4W ±10%)	[BR1~3]
13	RMPTN8202QCJJ	AK	N	B	Block resistor (2KΩ×8)	[BR4]
14	VCCCPU1HH101J	AB		C	Capacitor (50WV 100PF)	[C20]
15	VCCCPU1HH150J	AA		C	Capacitor (50WV 15PF)	[C13,14]
16	VCEAEU1CW106M	AA		C	Capacitor (16WV 10μF)	[C17]
17	VCKYPU1HB102K	AA		C	Capacitor (50WV 0.001μF)	
18	VCKYPU1HB471K	AA		C	Capacitor (50WV 470PF)	[C3,4,5,6,7,23,24]
19	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.1μF)	
20	VCTYPU1EX223M	AB		C	Capacitor (25WV 0.022μF)	[C9]
21	VHDEK04////-1	AD		B	Diode (EK04)	[D2]
22	VHERD39EB7/-1	AB	N	B	Zener diode (RD39EB7)	[ZD1]
23	VHiH4728A75FS	AX	N	B	IC (H4728A75FS)	[IC1]
24	VHiM66004FP-1	AY	N	B	IC (M66004FP)	[IC2]
25	VRD-RC2EY105J	AA		C	Resistor (1/4W 1.0MΩ ±5%)	[R9]
26	VRD-RC2EY202J	AA		C	Resistor (1/4W 2.0KΩ ±5%)	[R17,18,19]
27	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R8]
28	VRD-RC2EY273G	AA		C	Resistor (1/4W 27KΩ ±2%)	[R12]
29	VRD-RC2EY330J	AA		C	Resistor (1/4W 33Ω ±5%)	[R13,14,15,16]
30	VRD-RC2EY4R7J	AA		C	Resistor (1/4W 4.7Ω ±5%)	[R10,11]
31	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R3,4]
32	VRD-RC2EY473J	AA		C	Resistor (1/4W 47KΩ ±5%)	[R1,2]
33	VVKCC1040G/-1	BL	N	B	Display tube	
	(Unit)					
901	CPWBF7316RC01	BY	N	E	Display PWB unit	

6 Power supply PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	LBNDJ0004UCZZ	AA		C	Band	
2	LX-BZ6665RCZZ	AA		C	Screw (3×6)	
3	PRDAF6657RCZZ	AL		C	PS heat sink	
4	QCNCM1101CCZZ	AB		C	Connector (2pin)	[VIN CN]
5	QCNW-7575RCZZ	AE		C	PS cable (2pin)	[PS CN]
6	QCNW-7640RCZZ	AC	N	C	GND wire 1	
⚠ 7	QFS-C2521TAZZ	AE		A	Fuse (250V 2.5A)	[F1]
8	QFSHA1002CCZZ	AB		C	Fuse holder (MINI TYPE)	[F1]
9	RC-EZ688NRC1J	AQ		C	Capacitor (63WV 6800μF)	[C1]
10	RCiLC6652RCZZ	AK		C	Coil (MC182-201M)	[L1]
11	VCEAGU1VW228M	AG		C	Capacitor (35WV 2200μF)	[C2]
12	VCQYNA2AM103K	AA		C	Capacitor (100WV 0.010μF)	[C3]
13	VHDDBA20B//-1	AE		B	Diode (DBA20B)	[DB1]
14	VHiSTR2124/-1	AR		B	IC (STR2124)	[IC1]
15	XBPSD30P14KS0	AA		C	Screw (3×14KS)	
16	XNESD30-24000	AA		C	Nut (3NS)	
	(Unit)					
901	CPWBF7289RC06	BL	N	E	Power supply PWB unit	

7 Noise filter PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	QCNCM6785RC0C	AD		B	Connector,Male (3pin)	
⚠ 2	QFS-C1322QCZZ	AE		A	Fuse (250V 1A)	[F1]
3	QFSHA1002CCZZ	AB		C	Fuse holder (MINI TYPE)	[F1]
⚠ 4	RC-HZ104AUA2E	AE	N	C	Capacitor (250WV 0.1μF)	[C1]
⚠ 5	RC-HZ224AUA2E	AF	N	C	Capacitor (250WV 0.22μF)	[C2]
⚠ 6	RCiLC6654RCZZ	AF	N	C	Coil (PLAC5020R6)	[L1]
7	VRD-RB2HY394J	AA		C	Resistor (1/2W 390KΩ ±5%)	[R1]
	(Unit)					
901	CPWBF7326RC01	BB	N	E	Noise filter PWB unit	[TQ,TR,TS]
	CPWBF7326RC02	BB	N	E	Noise filter PWB unit	[KB]

8 Pop−up PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	LBNDJ0004UCZZ	AA		C	Band
2	QCNCW6918RC09	AH		C	Connector with wires (9pin)
3	QCNCW6918RC11	AK		C	Connector (11pin)
4	VVKFiP7B13/−1 (Unit)	AX	N	B	Display tube (FIP7B13]
901	CPWBF7136RC01	BD		E	Pop−up PWB unit

9 Articles for consumption

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	TPAPR6645RC05	AY	N	S	Roll paper (5rolls/pack)
2	PSHEK6804RCZZ	AD	N	S	Key sheet(Programing character)
3	PSHEK6796RCZZ	AK		S	Key sheet(Standard character)
4	PSHEK6777RCZZ	AC		S	Key sheet(Blank character)

10 Service route options & Service tools

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	LKGiM7113RCZZ	AK		B	Service key
2	GCOVB7047RCZZ	BA		S	Drip proof switch cover
3	LKGiM7126RCZZ	AL		S	Mode key grip cover (OP key only)
4	PSHEK6777RCZZ	AC		S	Blank key sheet
5	DKiT−8643RCZZ	BG		S	Journal near end sensor
6	LKGiM7346RCZZ	AX		B	Additional clerk key (Key No.=7)
	LKGiM7347RCZZ	AX		B	Additional clerk key (Key No.=8)
	LKGiM7348RCZZ	AX		B	Additional clerk key (Key No.=9)
	LKGiM7349RCZZ	AX		B	Additional clerk key (Key No.=10)
	LKGiM7350RCZZ	AX		B	Additional clerk key (Key No.=11)
	LKGiM7351RCZZ	AX		B	Additional clerk key (Key No.=12)
	LKGiM7352RCZZ	AX		B	Additional clerk key (Key No.=13)
	LKGiM7353RCZZ	AX		B	Additional clerk key (Key No.=14)
	LKGiM7354RCZZ	AX		B	Additional clerk key (Key No.=15)
7	DKiT−8633RCZZ	BE		S	Drawer fixing kit
8	CKOG−6708RCZZ	BU		S	Expansion PWB
9	UKOG−6704RCZZ	AV		S	Sio loop back connector

11 AC CORD

	NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
⚠	1	QACCJ1413QCZZ	AG		B	AC cord Japan, RB6, RB7, RC5, SC, SD
⚠		QACCA3441QCZZ	AL		B	AC cord SB
⚠	2	QACCD8411QCZZ	AN		B	AC cord U. S. A, Canada, Japan (Okinawa), Guam
		QTANP0004HCZZ	AB		B	Lug terminal U. S. A, Canada
⚠	3	QACCE3120QCN5	AP		B	AC cord RA1, RA2, RB3, RB5, SG, TQ, TR, TS, K AC cord Yugoslavia
⚠	4	QPLGA4501CCZZ	AK		B	Plug SE
⚠		QCNW-6629RCZZ	AN		B	AC cord SE
⚠	5	QPLGA0018WRE0	AN		B	Plug SH, RA5
⚠		QCNW-6629RCZZ	AN		B	AC cord SH, RA5, SHE
⚠		PHOG-1023CCZZ	AB		B	Bushing for AC cord SH, RA5, SHE
⚠	6	QACCL1018CCZZ	AS		B	AC cord KA, SL
	7	QTANP0004HCZZ	AB		B	Lug terminal RC2, SM, SMT, RC1, SBA, RB8
		QPLGA0006QCZZ	AN		B	Plug KB, SM, SMT, RC1, SBA, RB8, RC2
		QCNW-1035CCZZ	AH		B	AC cord KB, RC1, RC2, SM, SMT, SBA
⚠		QCNW-6629RCZZ	AN		B	AC cord RB8
⚠	8	QCNW-6629RCZZ	AN		B	AC cord RB4 (AC cord only. The plug is not included.)
⚠	9	QACCZ3423QCZZ	AH		B	AC cord SJ, SJ2

Note : Instead of AC cords QACCZ3421QCZZ/QACCK1008CCZZ, the AC cord QACCE1422QCZZ(No.3) is supllied as service spare part.

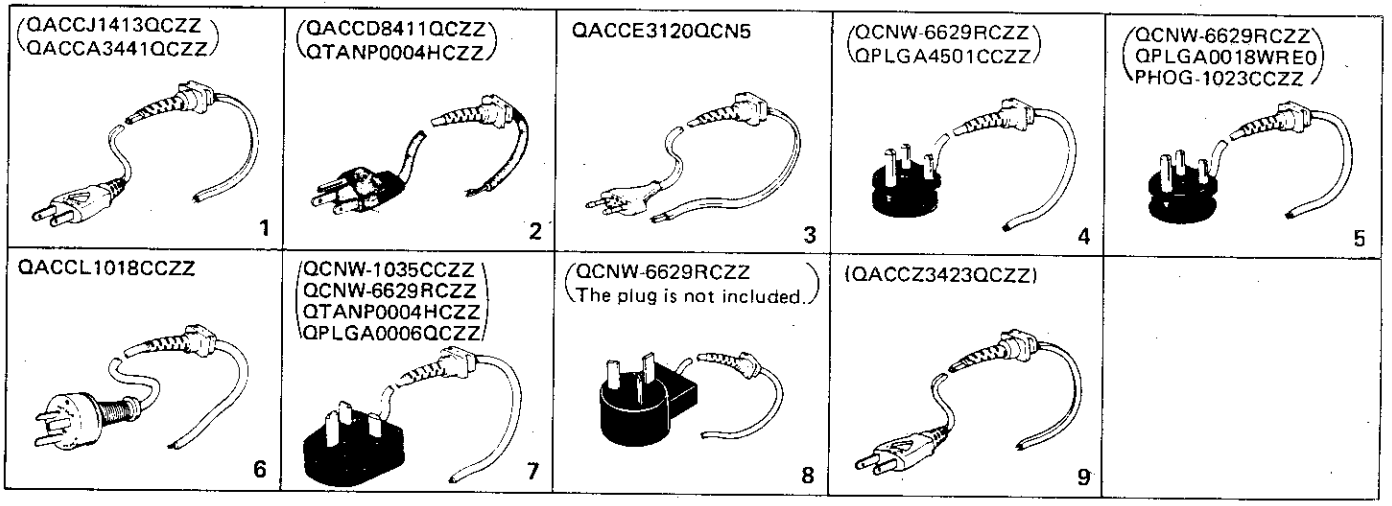

Table of destinations

SELECTION CODE	COUNTRIES
U	U. S. A., Guam
A	Canada
TS	Germany
TQ	SEEG territory other than Germany (Stamp : English)
TR	SEEG territory other than Germany (Stamp : Spanish)
KB	U. Kingdom
KA	Australia

SELECTION CODE	COUNTRIES
K	Korea

SELECTION CODE	COUNTRIES
RA1	Morocco, Algeria, Tunisia, West Africa
RA2	Chile, Uruguay, Peru, Argentina, Paraguay
RA5	Sri Lanka

SELECTION CODE	COUNTRIES
RB3	Indonesia
RB4	
RB5	Cyprus
RB6	Panama
RB7	Barbados
RB8	Malaysia (U. S. A. version)

SELECTION CODE	COUNTRIES
SB	Saudi Arabia (127V area)
SBA	Saudi Arabia (220V area)
SC	Taiwan
SD	Venezuela
SE	Hong Kong
SG	Lebanon, Syria, Greece, Pakistan, Iran, Egypt, Thailand, Iraq, Mauritius, Seychelles, Tahiti, Jordan, Sudan, Turkey
SH	South Africa (U. S. A. version)
SHE	South Africa (Europe version)
SJ	Philippines (Europe version)
SJ2	Philippines (U. S. A. version)
SM	Kuwait, Qatar, Oman, UAE, Malta, Bahrain
SMT	Nigeria, Yemen, Kenya

SELECTION CODE	COUNTRIES
RC1	Malaysia (Europe version)
RC2	Singapore
RC5	Dominican Republic, Ecuador

■ Index

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
〔C〕					
CCABB7141RC07	1- 9	BA	N	D	
CCOVA7038RC02	1- 1	AU		D	
CKOG-6708RCZZ	10- 8	BU		S	
CPWBF7136RC01	1- 5	BD		E	
//	8-901	BD		E	
CPWBF7289RC06	2- 24	BL	N	E	
//	6-901	BL	N	E	
CPWBF7316RC01	1- 15	BY	N	E	
//	5-901	BY	N	E	
CPWBF7326RC01	2- 2	BB	N	E	
//	7-901	BB	N	E	
CPWBF7326RC02	2- 2	BB	N	E	
//	7-901	BB	N	E	
CPWBX7315RC01	2- 23	CN	N	E	
//	4-901	CN	N	E	
CSW-S6850RC01	1- 28	AH		B	
〔D〕					
DKiT-8633RCZZ	10- 7	BE		S	
DKiT-8643RCZZ	10- 5	BG		S	
DUNTK9161RCZZ	1-501	BL		E	
〔G〕					
GCAB-7143RCZZ	1- 4	AH		D	
GCABA7142RCSD	2- 30	BD	N	D	
GCOVA7040RCSA	2- 31	AQ		D	
GCOVA7060RCZZ	1- 3	AP	N	D	
GCOVB7041RCZZ	1- 12	AY		D	
GCOVB7042RCZZ	1- 30	AW		D	
GCOVB7047RCZZ	10- 2	BA		S	
GFTAS6769RCSA	2- 29	AC		D	
GLEGG6653RCZZ	2- 40	AD		D	
〔H〕					
HDECB6828RCZZ	2- 55	AG		C	
HPNLC6818RCSF	1- 11	AK	N	D	
〔K〕					
Ki-OB6765RCZZ	2- 3	CK	N	E	
〔L〕					
LANGQ7472RCZZ	2- 22	AE		C	
LANGQ7476RCZZ	2- 11	AF		C	
LANGT7465RCZZ	1- 23	AK		C	
LANGT7501RCZZ	2- 5	AP	N	C	
LANGT7505RCZZ	1- 16	AM	N	C	
LBNDJ0004UCZZ	2- 50	AA		C	
//	2- 61	AA		C	
//	4-466	AA		C	
//	6- 1	AA		C	
//	8- 1	AA		C	
LBNDJ0013FCZZ	2- 64	AA		C	
LBNDJ2004SCZZ	1- 46	AA		C	
LCHSM6692RCZZ	2- 39	AV		C	
LHLDK6813RCSA	2- 15	AE		C	
LHLDW0001SCZZ	2- 26	AA		C	
LHLDW0004SCZZ	1- 34	AB		C	
LHLDW0007SCZZ	2- 18	AA		C	
LHLDW0008SCZZ	1- 53	AA		C	
LHLDW0024SCZZ	1- 31	AA		C	
//	2- 28	AA		C	
LHLDW2341RCZZ	2- 52	AB		C	
LHLDW5034BCZZ	1- 44	AB		C	
//	2- 59	AB		C	
LKGiM6784RCZZ	2- 37	AD		B	
//	3- 7	AD		B	
LKGiM7110RCZZ	1- 24	AG		B	
//	3- 5	AG		B	
LKGiM7111RCZZ	1- 24	AG		B	
//	3- 5	AG		B	
LKGiM7113RCZZ	10- 1	AK		B	
LKGiM7126RCZZ	10- 3	AL		S	
LKGiM7129RCZZ	1- 24	AE		B	
//	3- 5	AE		B	
LKGiM7340RCZZ	2- 56	AX		B	
//	3- 6	AX		B	
LKGiM7341RCZZ	2- 56	AX		B	
//	3- 6	AX		B	
LKGiM7342RCZZ	2- 56	AX		B	
//	3- 6	AX		B	
LKGiM7343RCZZ	2- 56	AX		B	
//	3- 6	AX		B	
LKGiM7344RCZZ	2- 56	AX		B	
//	3- 6	AX		B	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
LKGiM7345RCZZ	2- 56	AX		B	
//	3- 6	AX		B	
LKGiM7346RCZZ	10- 6	AX		B	
LKGiM7347RCZZ	10- 6	AX		B	
LKGiM7348RCZZ	10- 6	AX		B	
LKGiM7349RCZZ	10- 6	AX		B	
LKGiM7350RCZZ	10- 6	AX		B	
LKGiM7351RCZZ	10- 6	AX		B	
LKGiM7352RCZZ	10- 6	AX		B	
LKGiM7353RCZZ	10- 6	AX		B	
LKGiM7354RCZZ	10- 6	AX		B	
LKGiW2363RCZZ	2- 34	AL		B	
LKGiW7256RCZZ	1- 25	AP		B	
LKGiW7339RCZZ	2- 54	BB		B	
LX-BZ6665RCZZ	1- 17	AA		C	
//	2- 6	AA		C	
//	2- 57	AA		C	
//	4-467	AA		C	
//	6- 2	AA		C	
LX-BZ6754RCZZ	2- 43	AA		C	
LX-BZ6774RCZZ	1- 33	AA		C	
//	2- 7	AA		C	
//	2- 58	AA		C	
〔M〕					
MSPRK6660RCZZ	2- 36	AC		C	
〔P〕					
PFiLW6923RCSD	1- 6	AN	N	D	
PFiLW6924RCSD	1- 10	AM	N	D	
PFiLW6925RCZZ	1- 2	AK		D	
PFiLW6926RCZZ	1- 47	AD		D	
PRDAF6650RCZB	4-468	AG	N	C	
PRDAF6657RCZZ	6- 3	AL		C	
PSHEK6777RCZZ	1- 22	AC		C	
//	9- 4	AC		S	
//	10- 4	AC		S	
PSHEK6796RCZZ	1- 13	AK	N	C	
//	9- 3	AK		S	
PSHEK6804RCZZ	1- 14	AD	N	C	
//	9- 2	AD	N	S	
PSPAG6703RCZZ	1- 7	AB		C	
PSPAG6723RCZZ	5- 1	AF	N	C	
〔Q〕					
QACCE3120QCN5	2- 16	AL		B	
QCNCM1060AC03	4-458	AB		C	
QCNCM1101CCZZ	4-288	AB		C	
//	6- 4	AB		C	
QCNCM2379RC0E	4-457	AC		C	
QCNCM5278NCZZ	4-215	AC		C	
//	4-216	AC		C	
QCNCM6699RCZZ	4-217	AC		B	
//	4-218	AC		B	
QCNCM6785RC0C	7- 1	AD		B	
QCNCM6865RC0i	5- 2	AC		C	
QCNCM6865RC1A	5- 3	AD		C	
QCNCM6865RC2J	4-456	AD		C	
QCNCM6926RC1H	4-214	AE		C	
QCNCM7071RC6H	4-286	AN	N	C	
//	4-287	AN	N	C	
QCNCW1057ACZZ	4-459	AB		C	
QCNCW1084ACZZ	4-455	AG		C	
QCNCW6918RC09	8- 2	AH		C	
QCNCW6918RC11	8- 3	AK		C	
QCNCW7079RC3B	4-461	AF	N	C	
QCNCW7086RC5J	4-452	AK	N	C	
QCNW-7000RC18	1- 51	AC		C	
QCNW-7062RCZZ	2- 65	AQ		C	
QCNW-7063RCZZ	2- 66	AQ		C	
QCNW-7120RCZZ	1- 39	AE		C	
QCNW-7121RCZZ	2- 10	AD		C	
QCNW-7124RCZZ	4-469	AB		C	
QCNW-7212RCZZ	2- 16	AH		B	
QCNW-7434RCZZ	1- 29	AC		C	
QCNW-7575RCZZ	2- 42	AE		C	
//	6- 5	AE		C	
QCNW-7590RCZZ	2- 53	AC		C	
QCNW-7592RCZZ	2- 41	AD		C	
QCNW-7599RCZZ	1- 48	AK		C	
//	5- 4	AK		C	
QCNW-7615RCZZ	1- 50	AT		C	
//	5- 5	AT		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
QCNW-7616RCZZ	1- 49	AK		C	
〃	5- 6	AK		C	
QCNW-7617RCZZ	2- 70	AK	N	C	
〃	4- 453	AK	N	C	
QCNW-7618RCZZ	2- 68	AK	N	C	
〃	4- 284	AK	N	C	
QCNW-7619RCZZ	2- 69	AK	N	C	
〃	4- 195	AK	N	C	
QCNW-7620RCZZ	2- 13	AN	N	C	
QCNW-7623RCZZ	2- 67	AF	N	C	
QCNW-7640RCZZ	6- 6	AC	N	C	
QCNW-7641RCZZ	2- 8	AD	N	C	
QCNW-7642RCZZ	2- 62	AC	N	C	
QCNW-7644RCZZ	2- 63	AB	N	C	
QFS-A1037CCZZ	4- 219	AC		A	
QFS-C1322QCZZ	7- 2	AE		A	
QFS-C2521TAZZ	6- 7	AE		A	
QFS-C4081CCZZ	4- 221	AF		A	
QFSHA1002CCZZ	4- 220	AB		C	
〃	4- 222	AB		C	
〃	6- 8	AB		C	
〃	7- 3	AB		C	
QPLGA0006QCZZ	2- 16	AQ		C	
QSOCZ2042SC32	4- 269	AE		C	
〃	4- 271	AE		C	
〃	4- 272	AE		C	
QSW-C9212QCZZ	2- 17	AH		B	
QTANN6629RCZZ	2- 14	AF		C	
QTANP0004HCZZ	2- 20	AB		C	
【R】					
RALMB6640RCZZ	4- 2	AF		B	
RC-EZ106ARC1A	4- 5	AD		C	
〃	4- 9	AD		C	
〃	4- 11	AD		C	
〃	4- 13	AD		C	
〃	4- 17	AD		C	
〃	4- 27	AD		C	
〃	5- 7	AD		C	
RC-EZ106ARC1C	4- 6	AD		C	
RC-EZ107BRC1A	4- 4	AH		C	
RC-EZ476ARC1A	4- 18	AF		C	
〃	4- 22	AF		C	
〃	4- 28	AF		C	
〃	4- 29	AF		C	
RC-EZ688NRC1J	6- 9	AQ		C	
RC-HZ104AUA2E	7- 4	AE	N	C	
RC-HZ224AUA2E	7- 5	AF	N	C	
RC-KZ1054CCZZ	5- 8	AB		C	
RCiLC6633RCTZ	4- 285	AH		C	
RCiLC6652RCZZ	6- 10	AK		C	
RCiLC6654RCZZ	7- 6	AF	N	C	
RCiLZ1003LCZZ	4- 224	AB		C	
〃	4- 225	AB		C	
〃	4- 226	AB		C	
〃	4- 227	AB		C	
〃	4- 228	AB		C	
〃	4- 229	AB		C	
〃	4- 230	AB		C	
〃	4- 231	AB		C	
〃	4- 232	AB		C	
〃	4- 233	AB		C	
〃	4- 235	AB		C	
〃	4- 236	AB		C	
〃	4- 237	AB		C	
RCiLZ5017SCZZ	4- 238	AB		C	
〃	4- 239	AB		C	
〃	4- 240	AB		C	
〃	4- 241	AB		C	
〃	4- 242	AB		C	
〃	4- 243	AB		C	
〃	4- 244	AB		C	
〃	4- 245	AB		C	
〃	4- 246	AB		C	
〃	4- 247	AB		C	
〃	4- 248	AB		C	
〃	4- 249	AB		C	
〃	4- 250	AB		C	
〃	4- 251	AB		C	
〃	4- 252	AB		C	
〃	4- 253	AB		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
RCORF1008ACZZ	4- 391	AB		C	
〃	4- 393	AB		C	
〃	4- 416	AB		C	
RCORF1016LCZZ	1- 20	AL		C	
RCORF2029SCZZ	5- 9	AC		C	
RCORF6654RCZZ	1- 32	AH		C	
RCORF6661RCZZ	2- 45	AK		C	
RCORF6662RCZZ	1- 45	AK		C	
〃	2- 25	AK		C	
RCORF6673RCZZ	4- 234	AB		C	
RCORF6674RCZZ	4- 223	AB		C	
RCORF6682RCZZ	2- 47	AE		C	
RCORF6683RCZZ	1- 18	AM		C	
RCORF6684RCZZ	1- 52	AG		C	
RCORF6689RCZZ	2- 9	AZ	N	C	
RCORF7001SCZZ	2- 49	AL		C	
RCRSP6658RCZZ	5- 10	AE		B	
RCRSP6664RCZZ	4- 462	AF	N	B	
RCRSZ6644RCZZ	5- 11	AD		B	
RFiLN6014RCZZ	4- 254	AC		C	
〃	4- 255	AC		C	
〃	4- 256	AC		C	
〃	4- 257	AC		C	
〃	4- 258	AC		C	
〃	4- 259	AC		C	
〃	4- 260	AC		C	
〃	4- 261	AC		C	
RMPTC0473QCKB	1- 108	AD		B	
RMPTC6103QCKB	4- 445	AC		B	
RMPTC7104QCKB	5- 12	AC		B	
RMPTC8103QCKB	4- 442	AD		B	
〃	4- 443	AD		B	
〃	4- 444	AD		B	
〃	4- 446	AD		B	
〃	4- 447	AD		B	
〃	4- 448	AD		B	
〃	4- 449	AD		B	
〃	4- 450	AD		B	
〃	4- 451	AD		B	
RMPTN8202QCJJ	5- 13	AK	N	B	
RR-XZ8R2FRC3A	4- 299	AC	N	B	
RTRNH6783RCZZ	4- 460	AN		B	
RTRNP6859RCZZ	2- 4	BG		B	
【S】					
SPAKA8216RCZZ	3- 2	AQ	N	D	
SPAKA8217RCZZ	3- 4	AQ	N	D	
SPAKC8218RCZZ	3- 1	AU	N	D	
SPAKP5169SCZZ	3- 3	AE		D	
SSAKA1221QCZZ	3- 8	AA		D	
SSAKH3015CCZZ	3- 13	AA		D	
SSAKH4231CCZZ	3- 15	AA		D	
【T】					
TCADH6654RCZZ	3- 16	AB		D	
TCAUS1054CCZZ	3- 17	AB		D	
TCAUS6668RCZZ	1- 37	AA		D	
TiNSE7265RCZZ	3- 10	AY	N	D	
TiNSF7266RCZZ	3- 10	AY	N	D	
TiNSG7267RCZZ	3- 10	AY	N	D	
TiNSS7268RCZZ	3- 10	AY	N	D	
TLAB-4681CCZZ	2- 21	AA		D	
TPAPR6645RC05	9- 1	AY	N	S	
【U】					
UBATN2183CCZZ	4- 1	AV		B	
UBNDA1008CCZZ	3- 101	AA		C	
UKOG-6704RCZZ	10- 9	AV		S	
【V】					
VCCCPU1HH101J	5- 14	AB		C	
VCCCPU1HH150J	5- 15	AA		C	
VCCCTV1HH101J	4- 40	AA		C	
〃	4- 41	AA		C	
〃	4- 45	AA		C	
〃	4- 46	AA		C	
〃	4- 47	AA		C	
〃	4- 48	AA		C	
〃	4- 49	AA		C	
〃	4- 50	AA		C	
〃	4- 51	AA		C	
〃	4- 52	AA		C	
〃	4- 53	AA		C	
〃	4- 54	AA		C	

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PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VCCCTV1HH101J	4- 55	AA		C	
//	4- 56	AA		C	
//	4- 57	AA		C	
//	4- 58	AA		C	
//	4- 59	AA		C	
//	4- 64	AA		C	
//	4- 65	AA		C	
//	4- 66	AA		C	
//	4- 67	AA		C	
//	4- 68	AA		C	
//	4- 69	AA		C	
//	4- 70	AA		C	
//	4- 71	AA		C	
//	4- 72	AA		C	
//	4- 76	AA		C	
//	4- 81	AA		C	
//	4- 82	AA		C	
//	4- 83	AA		C	
//	4- 90	AA		C	
//	4- 117	AA		C	
//	4- 118	AA		C	
//	4- 119	AA		C	
//	4- 120	AA		C	
//	4- 129	AA		C	
//	4- 131	AA		C	
//	4- 132	AA		C	
//	4- 133	AA		C	
//	4- 134	AA		C	
//	4- 150	AA		C	
//	4- 151	AA		C	
//	4- 180	AA		C	
VCCCTV1HH221J	4- 145	AA		C	
VCCCTV1HH331J	4- 34	AA		C	
//	4- 35	AA		C	
//	4- 36	AA		C	
//	4- 85	AA		C	
//	4- 86	AA		C	
//	4- 88	AA		C	
//	4- 92	AA		C	
//	4- 93	AA		C	
//	4- 97	AA		C	
//	4- 98	AA		C	
//	4- 99	AA		C	
//	4- 100	AA		C	
//	4- 101	AA		C	
//	4- 102	AA		C	
//	4- 103	AA		C	
//	4- 104	AA		C	
//	4- 111	AA		C	
//	4- 121	AA		C	
//	4- 135	AA		C	
//	4- 136	AA		C	
//	4- 137	AA		C	
//	4- 138	AA		C	
//	4- 144	AA		C	
//	4- 169	AA		C	
//	4- 170	AA		C	
//	4- 171	AA		C	
//	4- 172	AA		C	
//	4- 175	AA		C	
//	4- 184	AA		C	
//	4- 185	AA		C	
//	4- 186	AA		C	
//	4- 187	AA		C	
//	4- 190	AA		C	
//	4- 191	AA		C	
VCCCTV1HH470J	4- 74	AA		C	
//	4- 77	AA		C	
//	4- 78	AA		C	
//	4- 79	AA		C	
//	4- 95	AA		C	
//	4- 96	AA		C	
//	4- 108	AA		C	
//	4- 113	AA		C	
//	4- 122	AA		C	
//	4- 123	AA		C	
//	4- 124	AA		C	
//	4- 125	AA		C	
//	4- 126	AA		C	
//	4- 127	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VCCCTV1HH470J	4- 128	AA		C	
//	4- 130	AA		C	
//	4- 139	AA		C	
//	4- 140	AA		C	
//	4- 142	AA		C	
//	4- 146	AA		C	
//	4- 147	AA		C	
//	4- 148	AA		C	
//	4- 149	AA		C	
//	4- 153	AA		C	
//	4- 154	AA		C	
//	4- 155	AA		C	
//	4- 156	AA		C	
//	4- 157	AA		C	
//	4- 158	AA		C	
//	4- 161	AA		C	
//	4- 162	AA		C	
//	4- 163	AA		C	
//	4- 164	AA		C	
//	4- 165	AA		C	
//	4- 166	AA		C	
//	4- 167	AA		C	
//	4- 168	AA		C	
//	4- 174	AA		C	
//	4- 177	AA		C	
//	4- 181	AA		C	
//	4- 188	AA		C	
VCEAEU1CW106M	5- 16	AA		C	
VCEAGA1CW106M	4- 3	AA		C	
//	4- 7	AA		C	
//	4- 10	AA		C	
//	4- 16	AA		C	
//	4- 21	AA		C	
//	4- 25	AA		C	
//	4- 26	AA		C	
VCEAGA1HW105M	4- 24	AB		C	
VCEAGA1HW106M	4- 12	AA		C	
VCEAGU1CW108M	4- 23	AD		C	
VCEAGU1CW336M	1- 113	AA		C	
VCEAGU1HW227M	4- 19	AC		C	
VCEAGU1HW477M	4- 20	AD		C	
VCEAGU1VW228M	6- 11	AG		C	
VCEAGU2AW226M	4- 15	AB		C	
VCEA2U1HW228M	4- 8	AH	N	C	
VCKYPU1HB102K	5- 17	AA		C	
VCKYPU1HB471K	5- 18	AA		C	
VCKYTV1HB102K	4- 30	AA		C	
//	4- 31	AA		C	
//	4- 32	AA		C	
//	4- 33	AA		C	
//	4- 38	AA		C	
//	4- 43	AA		C	
//	4- 44	AA		C	
//	4- 60	AA		C	
//	4- 61	AA		C	
//	4- 62	AA		C	
//	4- 63	AA		C	
//	4- 89	AA		C	
//	4- 109	AA		C	
//	4- 110	AA		C	
//	4- 112	AA		C	
//	4- 114	AA		C	
//	4- 116	AA		C	
//	4- 183	AA		C	
//	4- 189	AA		C	
//	4- 192	AA		C	
//	4- 193	AA		C	
VCKYTV1HB103K	4- 91	AB		C	
//	4- 179	AB		C	
VCKYTV1HB152K	4- 115	AA		C	
VCKYTV1HF104Z	4- 37	AA		C	
//	4- 39	AA		C	
//	4- 42	AA		C	
//	4- 73	AA		C	
//	4- 75	AA		C	
//	4- 80	AA		C	
//	4- 84	AA		C	
//	4- 87	AA		C	
//	4- 94	AA		C	
//	4- 105	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VCKYTV1HF104Z	4- 106	AA		C	
//	4- 107	AA		C	
//	4- 141	AA		C	
//	4- 143	AA		C	
//	4- 152	AA		C	
//	4- 159	AA		C	
//	4- 160	AA		C	
//	4- 173	AA		C	
//	4- 176	AA		C	
//	4- 178	AA		C	
//	4- 182	AA		C	
//	4- 194	AA		C	
VCQYNA2AM103K	6- 12	AA		C	
VCQYNU1HM683K	4- 14	AB		C	
VCTYPU1EX104M	4- 470	AB		C	
VCTYPU1EX223M	5- 20	AB		C	
VCTYPU1NX104M	5- 19	AB		C	
VHDDBA20B//-1	6- 13	AE		B	
VHDDSS133//-1	1- 111	AA		B	
VHDEK04////-1	5- 21	AD		B	
VHDSFPB54//-1	4- 197	AC		B	
//	4- 198	AC		B	
//	4- 208	AC		B	
VHDSFPL52V/-1	4- 201	AC		B	
//	4- 202	AC		B	
//	4- 204	AC		B	
VHD1SS353//-1	4- 196	AB	N	B	
//	4- 199	AB	N	B	
//	4- 200	AB	N	B	
//	4- 203	AB	N	B	
//	4- 205	AB	N	B	
//	4- 206	AB	N	B	
//	4- 207	AB	N	B	
//	4- 209	AB	N	B	
//	4- 210	AB	N	B	
//	4- 211	AB	N	B	
//	4- 212	AB	N	B	
//	4- 213	AB	N	B	
VHERD39EB7/-1	5- 22	AB	N	B	
VHERD4.3MB1-1	4- 464	AD	N	B	
VHERD5.6PB/-1	4- 465	AC	N	B	
VHERD6.2MB1-1	4- 463	AC	N	B	
VHiF258016PC/	4- 274	AZ		B	
VHiF258024PC/	4- 277	AZ	N	B	
VHiHM128F12SL	4- 267	BN		B	
VHiH4728A75FS	5- 23	AX	N	B	
VHiH641510810	4- 280	BA	N	B	
VHiiR9393N/-1	4- 265	AD		B	
//	4- 266	AD		B	
//	4- 276	AD		B	
VHiiR9431N/-1	4- 263	AG		B	
VHiMB8464R7LF	4- 275	AU	N	B	
VHiMC34063AMi	4- 279	AG		B	
VHiM66004FP-1	5- 24	AY	N	B	
VHiSN74HC00NS	4- 262	AC		B	
VHiSN74HC08NS	4- 268	AD		B	
VHiSN74HC14NS	4- 282	AE		B	
VHiSTA401A/-1	4- 278	AP		B	
//	4- 283	AP		B	
VHiSTR2124/-1	6- 14	AR		B	
VHiTA8428K/-1	4- 273	AN		B	
VHiTD62308F-1	4- 281	AH		B	
VHiTD62503F-1	4- 264	AF		B	
VHi27040RAA1A	4- 270	BS	N	B	
VHSDRA2TE//-1	4- 454	AG	N	B	
VRD-HT2EY472J	1- 112	AA		C	
VRD-RB2HY394J	7- 7	AA		C	
VRD-RB2HY561J	4- 298	AA		C	
VRD-RC2EY105J	5- 25	AA		C	
VRD-RC2EY202J	5- 26	AA		C	
VRD-RC2EY221J	5- 27	AA		C	
VRD-RC2EY273G	5- 28	AA		C	
VRD-RC2EY330J	5- 29	AA		C	
VRD-RC2EY392G	4- 300	AA		C	
VRD-RC2EY4R7J	5- 30	AA		C	
VRD-RC2EY472J	5- 31	AA		C	
VRD-RC2EY473J	5- 32	AA		C	
VRS-TS2AD100J	4- 387	AA		C	
VRS-TS2AD101J	4- 304	AA		C	
//	4- 305	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VRS-TS2AD101J	4- 345	AA		C	
//	4- 376	AA		C	
//	4- 377	AA		C	
//	4- 378	AA		C	
//	4- 379	AA		C	
//	4- 380	AA		C	
//	4- 381	AA		C	
//	4- 382	AA		C	
//	4- 383	AA		C	
VRS-TS2AD102G	4- 369	AA	N	C	
VRS-TS2AD102J	4- 307	AA		C	
//	4- 319	AA		C	
//	4- 320	AA		C	
//	4- 353	AA		C	
//	4- 354	AA		C	
//	4- 360	AA		C	
//	4- 361	AA		C	
//	4- 374	AA		C	
//	4- 388	AA		C	
//	4- 400	AA		C	
//	4- 402	AA		C	
//	4- 404	AA		C	
//	4- 410	AA		C	
//	4- 411	AA		C	
//	4- 412	AA		C	
//	4- 413	AA		C	
//	4- 414	AA		C	
//	4- 423	AA		C	
//	4- 433	AA		C	
//	4- 434	AA		C	
VRS-TS2AD103F	4- 399	AA		C	
VRS-TS2AD103J	4- 301	AA		C	
//	4- 302	AA		C	
//	4- 303	AA		C	
//	4- 306	AA		C	
//	4- 310	AA		C	
//	4- 324	AA		C	
//	4- 325	AA		C	
//	4- 326	AA		C	
//	4- 333	AA		C	
//	4- 334	AA		C	
//	4- 335	AA		C	
//	4- 336	AA		C	
//	4- 337	AA		C	
//	4- 338	AA		C	
//	4- 339	AA		C	
//	4- 340	AA		C	
//	4- 341	AA		C	
//	4- 342	AA		C	
//	4- 343	AA		C	
//	4- 347	AA		C	
//	4- 350	AA		C	
//	4- 351	AA		C	
//	4- 355	AA		C	
//	4- 363	AA		C	
//	4- 364	AA		C	
//	4- 365	AA		C	
//	4- 366	AA		C	
//	4- 367	AA		C	
//	4- 370	AA		C	
//	4- 373	AA		C	
//	4- 375	AA		C	
//	4- 384	AA		C	
//	4- 385	AA		C	
//	4- 386	AA		C	
//	4- 389	AA		C	
//	4- 390	AA		C	
//	4- 392	AA		C	
//	4- 394	AA		C	
//	4- 401	AA		C	
//	4- 403	AA		C	
//	4- 406	AA		C	
//	4- 409	AA		C	
//	4- 419	AA		C	
//	4- 420	AA		C	
//	4- 421	AA		C	
//	4- 425	AA		C	
//	4- 426	AA		C	
//	4- 427	AA		C	
//	4- 428	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VRS-TS2AD103J	4- 429	AA		C	
//	4- 430	AA		C	
//	4- 431	AA		C	
//	4- 436	AA		C	
//	4- 437	AA		C	
//	4- 438	AA		C	
VRS-TS2AD104J	4- 348	AA		C	
//	4- 349	AA		C	
//	4- 356	AA		C	
VRS-TS2AD122F	4- 396	AA		C	
VRS-TS2AD163F	4- 418	AA		C	
VRS-TS2AD182G	4- 368	AA	N	C	
VRS-TS2AD183F	4- 327	AA		C	
VRS-TS2AD2R2J	4- 332	AA	N	C	
VRS-TS2AD203J	4- 439	AA		C	
VRS-TS2AD220J	4- 344	AA		C	
VRS-TS2AD221J	4- 441	AA		C	
VRS-TS2AD241J	4- 311	AA		C	
VRS-TS2AD272F	4- 357	AA	N	C	
VRS-TS2AD273J	4- 352	AA		C	
//	4- 362	AA		C	
VRS-TS2AD330J	4- 440	AA		C	
VRS-TS2AD332J	4- 321	AA		C	
//	4- 328	AA		C	
VRS-TS2AD362F	4- 395	AA		C	
//	4- 417	AA		C	
VRS-TS2AD391J	4- 309	AA		C	
VRS-TS2AD472G	4- 397	AA		C	
VRS-TS2AD472J	4- 312	AA		C	
//	4- 313	AA		C	
//	4- 314	AA		C	
//	4- 318	AA		C	
//	4- 322	AA		C	
//	4- 323	AA		C	
//	4- 371	AA		C	
//	4- 372	AA		C	
//	4- 405	AA		C	
//	4- 407	AA		C	
//	4- 408	AA		C	
//	4- 415	AA		C	
//	4- 424	AA		C	
//	4- 435	AA		C	
VRS-TS2AD473J	4- 422	AA		C	
VRS-TS2AD562J	4- 308	AA		C	
//	4- 329	AA		C	
//	4- 331	AA		C	
VRS-TS2AD563J	4- 358	AA		C	
//	4- 359	AA		C	
VRS-TS2AD622J	4- 432	AA		C	
VRS-TS2AD680F	4- 315	AA	N	C	
VRS-TS2AD682J	4- 330	AA		C	
//	4- 346	AA		C	
VRS-TS2AD912G	4- 398	AA		C	
VRSTS2AD1151F	4- 316	AA		C	
VRSTS2AD1330F	4- 317	AA	N	C	
VS2SA1036KQRC	4- 293	AB		B	
//	4- 297	AB		B	
VS2SC2412K/-1	4- 294	AB		B	
//	4- 296	AB		B	
VS2SC4153-/-1	4- 291	AG		B	
//	4- 292	AG		B	
VS2SD1898//-1	4- 295	AD	N	B	
VS2SJ177///-1	4- 289	AP	N	B	
VS2SJ263///-1	4- 290	AM	N	B	
VVKCC1040G/-1	5- 33	BL	N	B	
VVKFiP7B13/-1	8- 4	AX	N	B	
【X】					
XBBSC30P06000	1- 8	AA		C	
XBBSC30P20000	2- 32	AA		C	
XBPBZ40P06K00	2- 19	AA		C	
XBPSD26P04K00	1- 26	AA		C	
XBPSD30P06KS0	2- 44	AA		C	
XBPSD30P14KS0	6- 15	AA		C	
XBSSD30P08000	4- 471	AA		C	
XCPSD30P12X00	2- 33	AA		C	
XEBSD30P06000	1- 21	AA		C	
//	2- 35	AA		C	
//	2- 60	AA		C	
XEBSD30P08000	1- 35	AA		C	
//	2- 12	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
XEBSD30P08000	2- 48	AA		C	
XHBSD30P08000	1- 19	AA		C	
XHPSD40P08KS0	2- 38	AA		C	
XNESD30-24000	2- 27	AA		C	
//	4- 472	AA		C	
//	6- 16	AA		C	
XUBSD30P10000	2- 46	AC		C	
XUBSD40P08000	2- 1	AA		C	
XUPSD23P08000	1- 27	AA		C	
XUPSD30P16000	2- 51	AA		C	
【0】					
0ALW-P5107-51	1- 104	AC		C	
0ALW-P5109-51	1- 105	AC		C	
0ALW-P9002-01	1- 101	AC		B	
0ALW-P9003-01	1- 102	AC		C	
0ALW-P9003-50	1- 103	AC		C	
0ALZD2006-670	1- 43	AA		C	
0ALZV12CK104E	1- 110	AD		C	
0ALZW8AA473DJ	1- 109	AA		C	
0ALZY03600874	1- 107	AH		B	
0ALZZ05200138	1- 106	AQ		B	
0AL101KFG-001	1- 40	AV		C	
0AL421KFG-001	1- 41	BB		C	
0AL9090E1002R	1- 42	BK		E	

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ER-A670VSM

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